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OF

The New-York State Agricultural Society.

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State Agricultural Rooms.

The Secretary's Office is in the New Agricultural Hall corner of State and Lodge streets, Albany.

ANNUAL MEETING—Second Wednesday, 8th of February, 1871.

New-York State Agricultural Society.

THE ANNUAL MEETING.

WEDNESDAY, *February* 8, 1871.—The Society will meet at the Capitol at noon for the reception of the reports of the Executive Committee and Treasurer and for the election of officers.

The evening session will be held in the Assembly Chamber. J. R. DODGE, Esq., of the Agricultural Department, and Professor LAW, of Cornell University, Consulting Veterinarian to the Society, have consented to deliver addresses. Other gentlemen have also been invited, whose replies have not yet been received.

THURSDAY, *February* 9.—The Winter Exhibition of grain, dairy produce, winter fruit, etc., will be open during the day at the Society's rooms.

The Society will meet in the Lecture room at half past ten o'clock in continuation of the Wednesday evening session.

EXECUTIVE MEETING.

December 20.—Present, the President, Vice-President Curtis, the Corresponding Secretary, the Recording Secretary, the Treasurer, Messrs. Ingalsbe, Morris, Chamberlain, Juliand and Wadsworth of the Executive Committee, and ex-Presidents Patrick and Faile.

Letters and excuses for non-attendance were received from Vice-Presidents Geddes, Angel and Church, from Messrs. Swan and Thorne, of the Executive Committee, and from ex-Presidents Gould and Campbell.

The Secretary was directed to reply to the communications of Theodore F. Butterfield, Esq., on behalf of the local committee at Utica, asking the Society to remit the payment of the sum of $1,200, agreed to be paid to the Society on account of the expense of clerks and police at the Fair as usual, on account of the funds at the disposal of the local committee having proved insufficient to meet their outlay; that the communications do not present sufficient ground for granting the desired relief; and to request a detailed statement of the expenditures of the Utica committee on account of the State Fair.

The Treasurer presented a statement of the finances of the Society, from which it appeared that the receipts of the Utica Fair were, $20,309.72; other receipts to date, $3,150.51; total, $23,460.23. Payments to date, $20,200.49.

The award of a bronze medal to W. H. Duval, of Utica, for his patent travelling trunks, omitted from the list sent in by the Judges, in Class IV, was confirmed, and a certificate of merit was ordered issued to A. M. Utley, of Watertown, for J. Blood's patent adjustable paper-box and bandage for cheese, the same having been recommended by the judges of dairy produce.

The action of the Secretary in obtaining the services of the Consulting Veterinarian to visit the farms in Dutchess county, infected with Foot and Mouth disease, was approved.

On motion of ex-President Patrick, it was

Ordered, That a committee of five be appointed to aid in preparing, and procuring the enactment of a law for protection of the flocks and herds of the State against infectious and contagious diseases; and the President appointed as such committee, ex-President Morris, ex-President Campbell and Messrs. Chamberlain, Juliand and Wadsworth.

The President appointed Messrs. J. B. Lyman, of New York, Vice-President Curtis, and John Haven, of New York, a committee to report on marketing farm produce, as requested by a resolution of one of the evening meetings at Utica.

The President, ex-President Gould, Vice-President Curtis, the Treasurer and Secretary were appointed a committee to make arrangements for the annual meeting

The report of Mr. F. Morris, executive officer in

charge of the department of fruits and flowers at Utica, in relation to the grapes exhibited by Mr. F. L. Perry, of Canandaigua, which were not all grown by himself, being considered, and it appearing that there was no concealment of fact or intent to violate the rules by Mr. Perry, it was ordered that no further action be taken in the matter.

THE DISTRESS AMONG THE FRENCH PEASANT FARMERS.

The state of affairs in the Northeastern part of France does not appear to have, as yet, been much noticed in our papers. The facts are, that over a very large extent of country inhabited chiefly by small farmers (or peasant proprietors), and having Metz as its centre, the destruction has been such, owing to both the German and French armies having subsisted off the country, that a famine is almost inevitable. The state of things is the more desperate because there are no crops in the ground, and a case is presented as urgently calling for aid as well can be imagined. The farmers of Great Britain are now subscribing money and grain to enable these poor people to put in their spring crops, and it can only be necessary to inform our farmers of the facts to secure their contributions. The Mark Lane Express of the 19th December says:—"The Rhenish provinces, over which the invading and opposing armies have equally passed, are precisely those in which the subdivision of the land has been carried to the greatest extent, so that the farmers—if they can be thus called—are poor and have nothing whatever to fall back upon when their little homesteads have been laid under contributions, as they have been by both friends and foes. It has been estimated that at least one-seventh portion—probably, now, much more—of the territory of France has been devastated by the war, and on this extensive tract of country all the produce of the late harvest has been consumed or destroyed by the contending forces."

The Society of Friends in England, with their ever ready and ever judicious benevolence, some time ago sent a committee to aid the sufferers about Metz, a fund of £20,000 having been raised for that purpose. Upon the beginning of the more general movement in England, John Bellows, a member of that committee, wrote a letter to the *London Times* containing the following statements:

"Briefly, we find the state of things and the remedy proposed for it as follows: (1.) The autumn ploughing has been almost universally neglected, owing to the pressure of the war in various ways, but more especially from the seizure of the horses necessary to do the work, and their employment in military service. and from the passage of large bodies of troops having exhausted the usual stores of grain and forage required to feed such horses. (2.) The loss of the seed corn and seed potatoes by requisitions."

"The Metz *Comice Agricole* suggests the following as the most feasible plan by which aid can be afforded the country: First, divide the *cultivateurs* into three classes: those who still have means to recover their position; those who have some, but not sufficient, means to do this; and, lastly, those who are so utterly ruined that they have no resources left. It is proposed that the first of these classes should pay full cost for any seed we may be able to furnish them with; the second a reduced price to be hereafter arranged by the aid of the Maires of the different communes; and the third class to receive free gifts of seed; the Maires, in conjunction with the President of the *Comice Agricole*, aiding us to decide in which of these classes a given individual is to be placed." * * * "What will be chiefly wanted are white oats, barley and a little, but very little, spring wheat, since the latter is a risky crop in this climate. The Mayor and Town Council of Briey especially beg, in addition to these, clover and vetches, for there is but little meadow land in the district and summer forage will be absolutely needful for cattle. Seed potatoes will also be of great value, and garden seed in small assortments for cottagers, such as beans, peas, carrots and salad herbs, which the French cook up in a variety of ways that an Englishman would not dream of."

Mr. Bellows also states that there will be no difficulty in getting the grain and seeds conveyed by water up the Rhine to Dusseldorf or Coblentz, and thence by barges on the Moselle to Metz.

It was proposed, in England, to receive contributions of grain and seeds; but as the freight on small parcels is relatively so much greater, it will, in almost all cases, be better for us Americans to send money to the English committee, formed under the auspices of the Royal Agricultural Society and the Smithfield Club, who will have all the necessary machinery for distribution. As their seed-time will begin in March we cannot act too promptly, and every dollar sent may save a life. If every Agricultural Society and Farmers' Club and every reader of this journal will only do a little, the *aggregate* cannot fail to be respectable, however small the *items*. Contributions may be sent by cheque or post-office order, to order of L. H. Tucker, treasurer State Agricultural Society, Albany, N. Y., and will be forwarded to the English committee.

CONTAGIOUS FOOT AND MOUTH DISEASE.

By Professor Law, of Cornell University, Consulting Veterinarian to the Society.

Synonyms.—This malady has been known by the most varied names in the same and in different countries. In *England* it goes under the name of *Murrain, Epizootic Aphtha, Eczema Epizootica, Epidemic, Blisters*, &c.:—in *France* of *Aphthes, Fi vre Aphtheuse, Maladie Aphtheuse, Stomatite Aph'heuse, Cocotte, Mal de Bouche, Phlyctine Glosso-pi d, Exanth me Intérphalangé, Maladie Aphthungulaire*, &c. :—in *Germany* of *Maul-und-Klauenseuche, Blasenkrankheit, Blasenseuche, Paronychia Epizootica, Bullæ Epizootica, Panaritium gennant*, &c.:—in *Holland* it is known as the *Tong blaar*:—in *Italy* as the *Loppina Epizootica, Afte Epizootiche, Mal di Ambolla, mal della bocca*, &c. :—in *Spain*, as *Pedero*.

Nature.—The disease is a contagious fever attended with an eruption of large vesicles or blisters on the integument and mucous membranes, but mainly and usually exclusively on the membrane lining the mouth, on the udder and teats, and above the margin of the hoofs or claws, and above all in cloven-footed animals between them. Like all such specific fevers propagated from animal to animal by a contagious principle, it has (1) a period of latency or incubation extending from the time of the reception of the poison into the system, to the manifestation of the first signs of illness; (2) a period of eruption during which there are all the symptoms of an active fever, attended by the formation of vesicles or blisters on the parts named; and (3) a period of decline in which the fever subsides and the sores left by the blisters gradually scab over and heal

up. The first of these periods does not extend on an average over forty-eight hours, though in some cases it appears to be prolonged to a week; the second period may last four or even six days;—while the third, in favorable cases, will pass over in from five to ten days more. The animals most susceptible to its attacks are the cloven-footed—cattle, sheep, goats and swine—but it may be communicated by drinking of the warm milk or, by inoculation, to all warm blooded animals, including even man himself.

Causes.—Like some other specific fevers the "foot and mouth disease" has its primary cause involved in obscurity. In all countries where it has gained a permanent footing or into which it is frequently introduced, there are not wanting advocates of a theory of its spontaneous generation from overdriving, filth, inclement weather, from atmospheric or epizootic influences and from other fanciful sources. Such explanations are but cloaks for our ignorance, for though like small-pox, sheep-pox, or the rinderpest, it must have originated somewhere, and may continue to do so under certain influences and conditions, of any such locality and conditions we are profoundly ignorant, and as regards those above named, which are met with all over the world, they are never found to generate it *de novo*, until after the poison has been introduced in a diseased beast or or on some other object, however much they may afterwards contribute to its maintenance and spread. Once introduced, however, into a country and extensively spread, and the poison will be dried up in barns and other dry places and preserved for an indefinite time, to be roused again into activity and to form new centres of disease whenever it can find its way into susceptible subjects.

The history of the disease is abundantly conclusive on this point. It prevailed in Europe at frequent intervals at least since 1695, but until 1839 there is no record of its existence in England. The climatic and atmospheric conditions and the treatment of animals were not so different on the Continent and in the British Isles as to account for any such absolute immunity of the latter. Nor have these conditions been so altered in Great Britain since this date, as to account for its uninterrupted prevalence in that country up to the present time. But from 1842 the Government has maintained the principle of free trade in cattle with the Continent, and has secured on cheap terms, their cattle and their contagia alike. The free railroad communication between the different parts of England and their large mixed markets of store and fat cattle (English and Foreign), have contributed equally to its sustenance and spread, though there can still be found in the island, districts devoted only to breeding and into which the disease has never penetrated.

Again, notwithstanding its long prevalence in Europe and more lately in England, it has not hitherto reached America, though its compeer "the contagious pleuropneumonia" has. Why this difference? Simply because pleuro-pneumonia has a preliminary period of incubation or latency of one or two months, during which, the animal bearing in its system the fatal germ, may be shipped from England and landed on our shores while still in apparently blooming health. Foot and mouth disease on the other hand cannot escape recognition for over two or three days, and would be well over before the animal could be disembarked. It was not so much by the seeds of disease in the system of the animal itself, as in the virus adherent to its surface and its rugs, &c., that America was liable to be contaminated. And this is unquestionably what has now taken place.

The progress of the disease at different times in Europe has followed the course of most other animal plagues, namely, from east to west. But this is only equivalent to stating that the great line of traffic has been from the great stock-raising plains of Asia and Eastern Europe to the more manufacturing and commercial west. In America the case is different, and hence, we now find the disease extending from Buffalo and Albany east and south. The various extensive outbreaks in Europe have, moreover, been usually in connexion with an extensive war, when the eastern herds were drawn upon largely for the supply of the armies in the field. In 1695, during the war in Flanders, it travelled westward and is first distinctly described by Valentin. In 1707 and 1756 it is reported as existing in Franconia, Poland. In 1764, just after the conclusion of a great war, Sagar speaks of it as prevailing over nearly the whole of Europe. In 1794, 1799 and 1800, its extensive ravages are again noteworthy in connexion with the wars which followed upon the French revolution, and later, at the conclusion of the Napoleonic wars, it is found to have gained a wide extension. In 1823, 1824, and 1825 it is still reported as existing in Italy, Switzerland, and Hungary, and similar reports come from the various countries up to 1834. At this date it became again more general, probably in connexion with the greater susceptibility of the cattle born since the last great outbreaks, and in 1838 nearly the whole of Continental Europe felt its ravages. In 1841 it is reported for the first time in Denmark, a dairying and breeding country rarely importing foreign cattle, and in 1839 we have the first report of its existence in Great Britain. Various gentlemen imported Dutch cattle into Norfolk or London and Cork, and by these were brought the seeds of this disease, which has never since been banished from the United Kingdom. In the general absence of railroads it spread slowly. It existed in Northampton in March, 1839, in Buckingham in May, in Stafford, not until the spring of 1840, in Lincolnshire in April, 1840, in Nottingham and Lancashire in July, 1840, in the different parts of Yorkshire from June to October, in Durham in October, 1840, in Westmoreland in November, in Northumberland, Cumberland and in the Scottish Lowlands in December 1840, or the spring of 1841, according to locality. This tardy progress contrasts widely with its present means of advancing, as well as with the terribly fatal spread of the rinderpest so lately imported into the same country, and is only to be explained by the present rapid movements of cattle. The victims of the Russian cattle plague were shown in Copenhagen Fields, London, and in less than 24 hours were delivered in Edinburgh, 400 miles distant. And these facts alone afford abundant evidence of the exclusively contagious nature of this disease, showing as they do so clearly that it is not any peculiar state of the weather, atmosphere or other surroundings that rouses it in any one locality, but only the presence of a diseased animal or its morbid product. This fact cannot be too strongly impressed upon us, as our future safety depends so entirely on the perfect seclusion of the diseased animals and the thorough disinfection of all localities where they have been.

The history of the present outbreak shows the same grand truth. Imported recently from England it has prevailed for several months in Canada; it existed two months ago in some of the counties in Northwestern New York, brought, according to the testimony I have been able to gather, by Canadian cattle. It reached

Albany by cattle transported on the New York Central Railroad from Buffalo, and was thence distributed among other places to Dutchess Co., N. Y., Sherman, Kent, and New Milford, Conn., and Hadley, Hatfield, Northampton, Easthampton and Mendon, Mass.

According to information furnished me by Assistant Commissioner, Dr. Guernsey, of Amenia, to whose kindness I was indebted for seeing the different affected herds, it was brought into Dutchess county by several distinct droves. *One* was brought from Albany, about 15th November, by a drover named Woolerton, to Poughkeepsie, and travelled across country to Pawling, where Mr. Peck bought from among them a yoke of oxen which infected his herd. The subsequent history of the Woolerton drove is not forthcoming.

A second drove was brought from Albany by a drover named Woolsey, at the same time and by the same route. They were kept over night by Philip Hoag, South Dover, and infected his stock; later they were turned for an hour into an empty barnyard at South Dover without the knowledge of the owner—Edward Preston—and his cows, afterward brought into the same yard to be milked, contracted the disease, as did also his swine. Later still this drove mingled with the cows of E. Wing, South Dover, in the public highway and conveyed the disease to them. The drove was at once driven to Connecticut, where it is said to have spread the malady extensively in New Milford, Sherman and Kent.

A third herd of 9 cows were bought at Albany, November 22d, by I. H. Morse, Amenia. Six had been bought of Dakin, a drover, and two, the first taken ill, of an Irishman. Eight of these cows were left with H. W. Smith, Amenia, and infected his original stock of eight.

A fourth herd was that of Eastman and Putnam, Amenia, 19 cows, brought from Albany in the first week of December, and which had conveyed the disease to 20 additional cows at the time of my visit.

A fifth lot of 20 in all were bought. November 20th, by Morgan Eighmire, La Grange, in St. Lawrence Co., and shipped through Albany to Poughkeepsie in a car (No. 256, N. Y. C. R. R.), for which he had telegraphed to Albany from Potsdam, and which proved to be very dirty. He first noticed the disease on November 26th, and it was soon conveyed to his home stock, pigs included.

The disease was conveyed to the valley of the Connecticut river by a lot brought from New York by a person of the name of Gaillard. Three were bought by a Mr. Cook, Hadley, Mass., and placed among his home cattle, which soon contracted the disease. Josiah Cook, a relative, sent a cow to Cook's bull, and his stock immediately showed symptoms of the disease.

In no case in this hemisphere does the disease arise without the specific morbid germ, and this may be conveyed from beast to beast by direct contact, by contaminated fodder, buckets, rugs, and other objects used about the barn, by the clothes and, above all, the infected hands and boots of attendants, by infected barns and roads over which the diseased stock have travelled, by the milk of sick animals, by water flowing past sick herds of which they drink or in which they stand, by dogs, fowls, or even rats, though these may not themselves fall victims, and in short by any body on which the discharges from the diseased surfaces may be received and carried.

Animals Susceptible.—All cloven-footed animals contract the disease with about equal readiness. To other animals it appears to be communicated mainly or solely by the contact of the morbid discharges with their mucous membranes, or by inoculation.

To *man* it is frequently conveyed by drinking the warm milk, or handling the mouths, teats or feet with raw or wounded hands. Valentin records that during the outbreak in Hesse, in 1695, men suffered from inflammation of the gums, tongue and mouth. During the outbreak of 1764, men who drank the milk were affected with aphtha. In 1828, it was communicated to men in Bohemia (Nadberny), in Styria (Levitzky), and Wurtemberg (Kolb). In more recent times Professor Hertwig and two students experimented on themselves. They each drank daily for three successive days a pint of the milk warm from the cow. On the second day Hertwig had a shivering fit, his mouth got hot and dry and his fingers itchy. On the sixth day numbers of vesicles (blisters) as large as a lentil had formed along the borders of the tongue, on the lips and inside the cheeks, and smaller ones on the hands and fingers. About the ninth day these burst, the fever subsided, and healing rapidly ensued. The students were less feverish but suffered from the eruption. Rayer, Bosquet, Londe, Levigney, and Dundussy have since noticed its transmission to man. In England such a transmission has been common and already in America at least one such instance has been noticed. Mr. Ed. Preston, South Dover, with his wife and several children having partaken of the milk before their attention was directed to the true nature of the disease, were affected with sore mouths and small blisters along the margin of the tongue. The disease is mainly to be dreaded in children that live exclusively on warm milk. Kolb noticed, in 1828, an acid vomiting and diarrhœa in such subjects. Hübner noticed that beside the vesicular eruption, children suffered from inflammation of the stomach and bowels, and that very young children fed on cow's milk died. Balfour, Watson and others have seen similar results in Scotland.

Its existence in *horses* is reported by Sagar, in 1764, and by Laubender, in 1800; but the susceptibility of the soliped must be quite as slight as that of man, and the disease appears to be roused only by inoculation or by taking the virus into the mouth with food. Horses may be safely used among the diseased stock, or for ploughing the manure under the soil.

Chickens are rather more susceptible, or more frequently drink the cast-away milk. They suffered in Franconia in 1756 (Hennicke), in Germany in 1764 (Sagar), in Italy in 1824 (Lamberlicchi), in many parts of Great Britain during the outbreak there; and already in New York in 1870, the fowls of Mr. Eighmire, La Grange, have suffered severely from an eruption on the legs. In other instances the throat has been equally affected, and the voice croupy.

Dogs and *cats* are not known to suffer but from drinking the milk. Sagar noticed it in both after they had partaken of the milk. At Mr. Eighmire's the milk of the diseased cows was given to a dog, which was attacked with swelling of the nose, mouth and throat, and diarrhœa. A dog of Mr. Preston's also partook of the milk, and had afterwards sore mouth, smacked his lips and went lame, and, at the time of my visit, had a scab in the interval between two digits on the lame foot.

All *young animals* feeding upon the milk are, like children, liable to diarrhœa. The same thing has been repeatedly noticed in pigs, to which the milk had been given without stint.

Symptoms.—After the period of incubation (one to six days), the disease is ushered in by a shivering, or,

in many cases, only by a little roughness of the coat and erection of the hair. The heat of the body is found to have already risen about 2° F., the mouth is hot, the muzzle dry, the membranes of the mouth and nose are red and often tender, and if there is to be an eruption on the feet and teats these parts are hot and swollen, the animal walks lame or inclines to lie, and shrinks from the handling of the udder in milking. The subject is often dull and listless, and feeds and ruminates less than in health. But, on the whole, these preliminary symptoms are often so slight as to be overlooked.

The vesicles usually begin to develope on the second or third day. They consist in little elevations of the cuticle by an albuminous liquid thrown out beneath it, and vary in size from three lines to over an inch in diameter. They mainly attack the edges and upper surface of the tongue, the inside of the cheeks and lips and the dental pad just behind the upper lip, though they often extend to the muzzle in cattle and even into the nostrils and throat. On the teats they are usually smaller, rarely extending to the diameter of an inch, though several may run into one and extend over a wide surface. On the digits they are equally small, and appear around the skin at the margin of the horn and in the space between the hoofs. The saliva now begins to drivel abundantly from the mouth and collects as a white froth outside the lips, and the animal produces, at intervals, a loud smacking noise with lips and tongue. Swine champ their teeth. Food is refused, especially if hard or fibrous, and rumination is often entirely stopped. When the eruption takes place on the foot the lameness is greatly increased. The animal stretches its hind limbs backward and shakes them as if to free them from some extraneous body, and seeks to lie most of its time. When the teats are affected the vesicles are seen to be surrounded by a red circle, the milking becomes more painful and the milk is withheld and dries up.

It is not usual to find all these parts extensively affected in the same animal. More commonly the eruption is concentrated on one, and appears to a slight extent only on the others. If the eruption is confined to the mouth the fever usually subsides on the full development of the vesicles, but this is not the case when mainly situated on the teats or feet. Probably the irritation attendant on milking and locomotion gives rise to a secondary fever, as in many cases of small pox.

The next stage is that in which the vesicles burst and the resulting sores heal up. On the mouth the vesicles burst very soon after they are formed. Their rupture is announced by a more profuse, glairy, and sometimes, bloody salivation, and, if the mouth is opened, by the raw pink surfaces on the tongue, &c. Those on the teats and feet do not usually burst till after thirty-six or forty-eight hours, and sometimes not for several days. The teats are left red and sore, the raw surfaces scab over, the scabs are too often detached in milking, the cow resents this process, holds back her milk, and sometimes suffers from inflammation and suppuration in the bag, while at others she becomes a confirmed kicker and perfectly useless for the dairy. When, on the other hand, the milk is drawn off carefully, and if need be with a milking tube, so as not to disturb the scabs, these drop off by the tenth or fifteenth day, leaving a slightly pink but healthy surface

When the feet are affected, as they usually are, the resulting sores are liable to be kept up and extended into unhealthy ulcers by the frequent contact with manure, clay or sand, and, not unfrequently, the inflammation thus established around the margin of the hoof extends to the sensitive parts beneath it, and results in the shedding of the entire hoof. This is often seen in pigs, but also in sheep and cattle when neglected and left out in cold, muddy weather. If, on the other hand, the feet are kept clean the sores will heal up as on the teats, and in about the same length of time.

By this time, or by the eighth to the sixteenth day of the disease, the appetite, rumination, and in cows the secretion of milk, are usually re-established, and the animals may be said to have quite recovered.

Sheep and pigs usually pass through the disease in ten days in all.

Dangerous complications are usually :—1st, extensive disease of the feet, shedding of the hoofs and death of of the bones of the extremities :—2d, inflammation, abscess or mortification of the udder:—3d, extensive effusions among the muscles in animals that have been driven far while suffering from the disease:—and 4th, diarrhœa with inflammation of the mucous membrane of the intestinal canal in young animals fed on the diseased milk. Any one of these complications may prove fatal. Short of this, they often lead to abortion in pregnant females, or unfit the animal for the uses of the dairy, work or feeding.

Prognosis (Probable Result).—The great majority recover from this disease. Deaths are exceptional if the animals are properly cared for. Yet the loss to the proprietor is none the less real, and when the disease extends widely over a country, millions of dollars are lost in a short time. There is first, in dairy cattle, the entire loss of milk throughout the disease; there very often remains a blind quarter in the udder; extensive abortions render the cows unproductive for the coming year; feeding stock lose ruinously in flesh, and unless the feet are perfectly restored do not again acquire it. Working oxen are incapacitated alike for labour and satisfactory fattening so long as the feet remain imperfect. But, worse than all, the virus gets hidden away and preserved in unsuspected places to repeat the tale of trouble and disaster in succeeding years.

Curative Treatment.—This is simple enough, and, in good hands, very satisfactory. Like small pox, cow pox or any other specific fever, this disease will run its prescribed course. But we may avoid complications and conduct it to a favorable issue by judicious management. In the early stages, if the animal is costive, as it usually is, the bowels should be opened by giving to cows eight ounces glauber salts with half a pound of molasses, dissolved in two quarts of water and given cool. Half this amount may be given to an animal of eighteen months, one-third to a year-old, and a fourth to a six months calf or a sheep. A pig may have from one to three ounces of castor oil, according to his size. Large doses should be carefully avoided, as liable to debilitate the animal and aggravate the disease.

The food throughout should be soft, cool and laxative. Roots pulped, finely sliced or boiled and allowed to cool before giving, are often very grateful to the sore mouth. Mashes of wheat bran made with boiling water and allowed to stand till cool are equally useful. Brewers' or distillers' grains given with a large quantity of water may form a good substitute for either.

Throughout the course of the disease the affected parts must be kept scrupulously clean and free from all sources of irritation. After the vesicles have burst, the mouth may be washed daily or more frequently with an astringent lotion, of which the following may be given as examples:

Borax,	1 oz.
Tincture of myrrh,	1 oz.
Water,	1 qt.

Or

Vinegar,	1 pt.
Honey,	3 oz.
Tincture of myrrh,	1 oz.
Water,	1 pt.

Or

Carbolic acid (crystals),	1 dr.
Water,	1 pt.

The last is probably the best, as at once disinfecting the discharges, acting as a stimulant and astringent to the raw surfaces, and relieving the suffering by reducing their sensibility.

The sores on the teats may be dressed with the following:

Carbolic acid,	½ drachm.
Glycerine,	10 ounces.

The milk must be drawn off carefully, and, if the sores are extensive, by means of a silver milking tube, introduced with great care and moved round until all the milk has escaped. Inflammation of the udder may necessitate that it be fomented with warm water for an hour twice daily, and afterwards rubbed with an ointment composed of

Extract of belladonna,	1 drachm.
Lard,	1 ounce.

Should it remain swollen and hard after inflammation has subsided, it should be daily rubbed with iodine ointment. If matter forms it is of importance to open the sac with a sharp knife or lancet, and obviate the danger of it bursting into the milk ducts.

To protect the feet from irritants the patients should be kept on a clean, smooth floor. A well littered shed will often be preferable, as there is much danger from admitting them into barns beside fodder which must afterwards be consumed. The building, in any case, should be clean and well ventilated. The sores on the feet require powerful applications. The parts must first be cleansed by drawing a coarse rag through between the claws to detach any shreds of dead cuticle, and expose a fresh sensitive surface. To this may be applied, with a feather or soft brush, either strong carbolic acid, or a solution of one part of sulphuric acid in three parts of water. This done, a strip of strong cotton fifteen to eighteen inches long is covered with tar to the extent of three inches in its middle part, drawn up between the claws so as to apply the tar on the diseased surface, and finally tied round the fetlock. This has the double effect of protecting the diseased surface from contact with filth, and maintaining, applied to it, a stimulant and antiseptic dressing which greatly facilitates healing. One such dressing is usually enough. In dressing the hind feet I have found great benefit from the use of a stout, round wooden bar passed beneath the leg in front of the hock joint, and held by a man at each end so as to raise the leg and carry the foot backward. The leg is thus easily held, and the person applying the dressing is saved from all danger.

If matter has formed beneath the hoof, all horn separated from the quick must be carefully pared away and the part dressed as for the sores between the claws. If the inflammation runs high let the foot be poulticed a day or two before applying the caustics and tar.

Prevention. First, its importation must be checked.—Efforts to root it out of the respective States must be fruitless so long as it is constantly fed from abroad. We can produce our own beef and dairy cattle, and need not woo disease for the sake of relieving our neighbour of his surplus. The order prohibiting importation of cattle from England must be extended to embrace the Canadas, at least until they can show a clean bill of health. The scope of this order should also be widened so as to include all ruminating animals (goat, sheep, deer) and swine. This is a necessary precaution against a blight which, sown in our land, will germinate and bring forth its evil fruit to our permanent and constantly increasing loss.

Secondly, diseased stock must be carefully secluded from all except their necessary attendants.—We have already seen how contagious this malady is, even through the clothes, hands and boots of man, and the legs, &c., of animals, themselves unaffected, through rugs, buckets, fodder, water and the like. Diseased stock should thus be kept rigidly apart from all fodder, public highways, streams flowing through other pastures, stray dogs and even poultry. It is advisable to keep dogs tied up in localities where the disease exists. Even the professional attendant should wash his hands with a solution of carbolic acid and sponge his boots with the same before approaching other animals.

In case of accidents the diseased stock should be kept as far as possible from healthy ones, but it is a fortunate circumstance that the contagious principle of this malady does not travel readily, if at all, through the atmosphere, and if all communication, mediate as well as immediate, is prevented, a diseased and healthy stock may be kept on opposite sides of a highway without the latter contracting the disease. This fixity of the contagium is of the greatest importance in enabling us to circumscribe the disease and extinguish it. But while it may not be wafted from place to place like pleuro-pneumonia or rinderpest, it surpasses both in the readiness with which it is transmitted by direct contact, and through intermediate solid bodies carried from the sick to the healthy.

Thirdly, infected roads should be closed.—When diseased stock have passed over a highway it should be closed to all ruminants and pigs for at least 30 days. If abundant rains fell in the interval the roads might perhaps be safe at a much earlier date, but if on the other hand the virus were dried or frozen up it might remain for this time inactive and be roused into activity on the accession of damp or thaw. The poison of this disease is not extinguished like that of Texan Fever by intense cold.

Restrictions on the movements of cattle.—In affected counties all movements of live stock, horses excepted, should be prohibited, except under a written *permit* of the local authority appointed for that purpose. Otherwise there is danger of cattle being taken from diseased herds, and sent among others to spread the disease, though apparently healthy themselves. Also of their removal in the early stages of recovery and before they are safe to mingle with others.

Railroad cars yards and banks, to be cleansed and disinfected.—On every railroad by which diseased cattle have been conveyed, the loading banks and yards should be thoroughly scraped and afterwards thickly sprinkled with carbolic acid. The cattle cars should be washed with a strong solution of caustic soda and afterward soaked with crude carbolic acid.

Disuse or boiling of milk.—The milk should be thrown away until the cow has quite recovered as

shown by the falling of the crusts. It does not appear that the milk will convey the disease unless impregnated with the contents of the ruptured vesicles or the exudation from the raw surface; hence the wide divergence of opinion as to its wholsomeness. When containing such matter and when taken warm by susceptible subjects there can be no doubt that it is virulent. But as the virus is destroyed by a temperature of 212° F., it ought to be boiled in all cases where it is necessary to give it to calves or other young animals. To allow it to be sold and sent off the place is but to open the door for the spread of the contagion.

No diseased cattle should be moved for fifteen days after full recovery.—The mere fact of recovery of health does not ensure that all the contagious principle has been removed from the system, and cattle that have passed through the disease and are apparently well have frequently introduced it among healthy stock.

Buildings, utensils, &c., to be cleansed and disinfected.—Buildings in which diseased animals have been, must be purified in the same manner as the cattle cars before bringing in healthy stock. Buckets, rugs, and other necessary adjuncts must be treated in the same way. Manure must be thoroughly removed, and ploughed under by horses, the yard where it had lain being afterward saturated with a solution of carbolic acid.

No new and healthy stock should be brought on the same premises until these have been thoroughly disinfected, nor on fields occupied by diseased stock for at least thirty days after the last sick beast has left. It were better to keep such fields unoccupied until the following spring.

REPORT OF SPECIAL COMMITTEE ON DAIRY APPARATUS AT UTICA.

The special committee appointed to test dairy apparatus at the State Fair, held at Utica September 27th, 28th, 29th and 30th, 1870, in addition to the report then made and reserved to report on a future day, report as follows:

The tests were made with water and the temperature obtained by the use of six thermometers, placed at equal distances from the ends and sides of the several vats, and immersed each the same depth in the water.

A test was made with William Ralph & Co.'s cheese vat "New Style," of the capacity of 500 gallons, with 400 gallons of water. Temperature of water was 62° on surface and 60° on bottom of vat. The temperature was taken at intervals of ten minutes, as follows:

10 minutes—mean temperature 68⅔°
20 minutes—mean temperature 68⅓°
30 minutes—mean temperature 74⅓°
40 minutes—mean temperature 79⅓°
50 minutes—mean temperature 88⅔°
90 minutes—mean temperature 98⅔°
90 minutes—mean temperature
of water on bottom of vat was 92°

This vat has a detachable heater standing at the end of the vat, connected with the vat by two four-inch pipes with shut-off or valves. One of these pipes conducts the heated water to a water chamber at the end of the vat; from there the water passes beneath a false bottom on which rests the inner vat; from there the water is distributed under and around the vat; then passes over the false bottom and in contact with the inner vat, and conducted by the return pipe to the bottom of the heater. Fifty-four pounds of wood was consumed in raising the water to the temperature indicated.

A test was made with Charles Miller and Son's circulating coil heater and cheese vat No. 15, of the capacity of 600 gallons, with 500 gallons of water. Temperature of water was 62° on surface and 61° on bottom of vat. Temperature at intervals, as follows:

10 minutes—mean temperature 62°
20 minutes—mean temperature 67⅔°
30 minutes—mean temperature 72⅓°
40 minutes—mean temperature 76⅔°
50 minutes—mean temperature 80⅔°
94 minutes—mean temperature 99°
94 minutes—mean temperature
of water on bottom of vat was 94⅓°

This vat was heated with Miller's patent circulating coil heater, with iron pipes extending along each side of the bottom of the vat, with return pipes perforated for distributing the heated water under and around the inner vat, with pipe in bottom to return water from vat to the coil heater.

Sixty-nine pounds of wood was consumed in the heating of tank and the water in the vat to the temperature indicated.

The circulating heater and the detachable heater of the "New Style" vat works on the principle that as the water becomes heated it forces itself out through the pipes under the vat, the cold water being forced into the tank, thus keeping up a continuous circulation.

A test was made with Ralph's Oneida cheese vat No. 15, of the capacity of 600 gallons, with 500 gallons of water. Temperature of water was 60° on surface and on bottom of vat. Temperature at intervals, as follows:

10 minutes—mean temperature 64⅔°
20 minutes—mean temperature 68°
30 minutes—mean temperature 75⅔°
40 minutes—mean temperature 83⅓°
50 minutes—mean temperature 90°
65 minutes—mean temperature 99°
65 minutes—mean temperature
of water on bottom of vat was 95⅔°

This vat, the space between the outer and inner vats, was filled with water which was heated with a horizontal tubular fire-box running under the whole length of the inner vat, with smoke-pipe from the rear end. Around the fire-box is a space for the water, communicating the whole length with the water space between the vats. Over the heater, in the space between the two vats, is what is termed an "Equalizer," which compels the heated water to circulate to all parts around the vat. Fifty-four pounds of wood was consumed to bring the water in the vat to the temperature above indicated.

In making these tests the water in the vats was kept as free as possible from any agitation.

The New Style and Ralph's Oneida vats stood out, while the Miller vat was under shelter. The New Style, standing exposed to the sun, showed two degrees difference in temperature between the top and bottom of the water in the vat. The Miller vat, standing under shelter, received less of the effects of the sun, causing a difference of only one degree in the temperature of surface and bottom. Ralph's Oneida vat, standing without shelter, was exposed to a cool atmosphere and wind, equalizing the top and bottom of the water in the vat.

The committee are of the opinion that to make the tests so that they shall show the working in its true light, the circumstances and conditions of all the vats should be the same. The cool wind and atmosphere tended to equalize the temperature of the top and bottom of the water in the Ralph's Oneida vat, while the effects of the sun had an opposite tendency in the case of the New Style and the Miller vats.

Jones, Faulkner & Co. and O. O'Neil, Son & Co. exhibited cheese vats that were not tested.

The committee think it proper, aside from the tests, to take into account the construction of the several vats, irrespective of working qualities; it being desirable that a vat shall contain the essential elements approaching nearest to perfection. The inner vat should be made with as few seams as possible, and the seams be well filled so that in passing a sponge or cloth over the surface in washing, it will touch every part of the vat. The angles of the vat should be rounded, so that there shall be no sharp corners or angles. In respect to these points the Miller and O'Neil vats approached nearest, the latter being of the best workmanship. These vats were made from large sheets of tin varying from five to thirteen pieces to each, according to size of vat.

The committee find that the Oneida vat used less fuel, required less time, and distributed the heat more evenly than the Miller vat. The trials of these vats were made, however, under different circumstances, which, in the opinion of the committee, tended, in some degree, to produce the difference above named. In the distribution of the heat both vats indicated the skill of the manufacturers, and that almost perfect success in this respect had been attained.

The committee recommend the award of the first premium to the Oneida vat, for the economy in fuel and perfection of its workings; and, also, would recommend the award of a suitable premium to the Miller vat for successful working and superior workmanship in the construction.

HARRIS LEWIS, Frankfort,
JOSIAH SHULL, Ilion,
T. W. MOORE, New Hartford,
MORGAN BUTLER, "
Committee.

SEEDS OF KINDNESS.

Howard is not only the proudest name in the English aristocracy; it is the name which the great philanthropist covered with more enduring honor than is conferred by stars and ribbons. And now another Howard of England (not of the Duke of Norfolk's lineage) has done an act of mercy. Plain Mr. James Howard, member of Parliament for Bedford, has proposed to supply the French farmers and peasants who have been ruined by the war, with cereals, roots and seeds for the rehabilitation of their farms. This proposition has been brought to the notice of the Smithfield Club, whose fat cattle are the glory and the joy of the London Christmas, by the president of that body, the Earl of Powis, a descendant of Lord Clive, the conqueror of India. Mr. Howard has corresponded with M. Drouyn de L'Huys, one of Napoleon's late cabinet ministers, on the subject, and the Minister of the Interior of the provisional government of France has signified to the exiled officer that this aid will be timely and acceptable. Mr. Howard and the Earl are indeed agriculturists of merit, for in their considerate kindness to the ruined French peasantry, they are sowing the seeds of grateful remembrance and of good will between the two countries of France and England.—*New York Evening Post*, Jan. 16.

THE POINTS OF THE PIG.

The following is the paper in full with which we have been favoured by Mr. John Fisher, of Carhead:

1. HEAD AND EARS.—The head should be wide in front; ears erect, and pointed forward; chaps rounded, and well filled up to the brisket.

2. CREST AND SHOULDERS.—Crest wide, and rising well to the shoulders; shoulder-blades well sloped backwards.

3. RIBS AND LOINS.—Ribs well sprung; loins wide, and slightly arched.

4. HIND-QUARTERS.—Hind-quarters not to slope, nor narrow, towards the tail.

5. HAMS.—Hams rounded outwards, well let down, and full at the twist.

6. CHEST.—Chest wide, with elbows well out.

7. FORE-RIBS AND FLANK.—Fore-ribs wide underneath; flank well let down, straight, and well filled to the stifle.

8. LEGS AND FEET.—Legs straight and small in the bone; feet small and compact.

9. HAIR AND COLOUR.—Hair plentiful, bright, and vigorous; colour to denote purity of breed.

10. TAIL.—Tail entire, thick at root, and tapering.

11. SIZE.—Size according to the breed.

TABLE GIVING THE FULL VALUE TO PERFECTION IN EVERY PARTICULAR POINT IN THE PIG:

No.		Award to Perfection.
1.	Head and Ears	8
2.	Crest and Shoulders	8
3.	Ribs and Loins	12
4.	Hind-quarters	10
5.	Hams	12
6.	Chest	10
7.	Fore-ribs and flank	15
8.	Legs and Feet	10
9.	Hair and Colour	10
10.	Tail	5
11.	Size	10

Award a less number to each of these points in the proportion that it falls short of perfection or the highest standard of excellence. Thus—if the head be long or narrow, the chap light, and the ears hang down over the eyes, award only 6 or 4, or 2 or 0, as they may deserve; and so on through all the points. Then add the number of awarded points together, and the total will give the order of merit in the animal.—*Mark Lane Express*, Dec. 5, 1870.

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THE JOURNAL

OF

The New-York State Agricultural Society.

VOL. XXI.] ALBANY, FEBRUARY, 1871. [NO. 2.

OFFICERS FOR 1871.

President—RICHARD CHURCH, Belvidere, Allegany county.

VICE-PRESIDENTS.

1st district—THOMAS H. FAILE, JR., 180 Water st., New York.

2d district—EDWIN THORNE, Millbrook, Dutchess county.

3d district—JURIAN WINNE, Bethlehem Centre, Albany county.

4th district—FRANK D. CURTIS, Charlton, Saratoga county.

5th district—JAMES GEDDES, Fairmount, Onondaga county.

6th district—WM. M. ELY, Binghamton, Broome Co.

7th district—BENJ. F. ANGEL, Geneseo, Livingston county.

8th district—HORACE S. HUNTLEY, Little Valley, Cattaraugus county.

Cor. Secretary—THOS. L. HARISON, Morley, St. Lawrence county.

Rec. Secretary—WILLIAM H. BOGART, Aurora, Cayuga county.

Treasurer—LUTHER H. TUCKER, Albany.

Executive Committee--ADIN THAYER, JR., Hoosick Falls, Rensselaer county; MILO INGALSBE, South Hartford, Washington county; FORDHAM MORRIS, Fordham, Westchester county; ROBERT J. SWAN, Geneva, Seneca county; HARRIS LEWIS, Frankfort, Herkimer county; GEORGE H. BROWN, Millbrook, Dutchess county; JOSEPH JULIAND, Bainbridge, Chenango county; JOHN L. COLE, Lyons, Wayne county.

Ex-Presidents—T. C. PETERS, J. STANTON GOULD, MARSENA R. PATRICK, THOMAS H. FAILE, SAMUEL CAMPBELL, SOLON D. HUNGERFORD.

Entomologist—ASA FITCH, M. D.

Chemist to the Society—CHARLES H. PORTER, M. D.

Mechanical and Consulting Engineer—HENRY WATERMAN.

Consulting Veterinarian—Prof. JAMES LAW, M. R. V. C.

State Agricultural Rooms.

The Secretary's Office is in the New Agricultural Hall corner of State and Lodge streets, Albany.

New-York State Agricultural Society.

EXECUTIVE MEETING, FEBRUARY 7, 1871.

The Executive Committee met at the Agricultural rooms, at Albany, on Tuesday the 7th day of February, 1871, at three o'clock P. M.

There were present: Vice-Presidents Winne, Curtis, Geddes, Ely, Angel and Church; the Secretaries; the Treasurer; Messrs. Ingalsbe, Swan, Thorne, Morris and Juliand of the Executive Committee, and Ex-Presidents Gould, Patrick and Faile.

Letters and excuses for non-attendance were received from Vice-President Faile, from Messrs. Chamberlain and Wadsworth, from Ex-President Campbell, and from the President.

The chair was taken by Ex-President Gould.

On motion, Vice-Presidents Geddes and Angel, were appointed a committee to audit the Treasurer's accounts.

On motion, it was *Ordered*, That no fees of members be received at the meeting in the Assembly Chamber on Wednesday.

On motion, Messrs. W. H. Bogart, S. A. Bunce and George Tweddle, were appointed Inspectors for the election of officers at the Annual Meeting, in case a ballot shall be demanded.

On motion, the Secretary was directed to inform the State Medical Society, that this Society will yield the occupancy of the Assembly Chamber on Wednesday evening, in case the Medical Society can make no satisfactory arrangement for its meeting in another place.

The Secretary presented the account of the expenditures of the Utica local committee, furnished by their Treasurer, as requested at the last meeting.

The report prepared, as the report of the Executive Committee to the Society and the Legislature, was read and approved.

The Committee then adjourned until Wednesday morning.

WEDNESDAY, 10.30 A. M.

On motion, Vice-President Angel was appointed to preside at the Annual Meeting of the Society, the President being unable to be present on account of indisposition.

The Auditing Committee reported that they had examined the Treasurer's accounts and vouchers, the securities in his possession, and the bank book showing the balance in bank as stated, and found the accounts to be correct; and the usual certificate was made and signed to that effect.

On motion, the Committee then adjourned.

THE ANNUAL MEETING.

The New York State Agricultural Society met in the Assembly Chamber on Wednesday, the eighth day of February, 1871, at noon. Mr. Hungerford, the President of the Society, being absent, on account of illness, the Honorable B. F. Angel, of Geneseo, presided.

The report of the Executive Committee was read as follows:

REPORT OF THE EXECUTIVE COMMITTEE.

The season of 1870 has, in the greater part of the State of New York, been remarkable for the extreme heat of the summer, and, in a greater degree, for the

unusually scant rainfall and long-continued drought. As a consequence, the yield of all the cereals has been more or less diminished; wheat least, barley and oats the most. The crop of Indian corn was of unusually good quality, having matured very early; that of potatoes was light; and fruit of all kinds gave an abundant yield. The prices of grain have been low, owing to the low range of prices in all European markets, which, together with our home markets, have been influenced by the large crops of wheat, barley and corn in the Western States. The dairy interest has suffered greatly, the character of the season having very materially reduced production, while prices have been rather lower than were obtained for the large product of 1869. The year 1870 has, however, passed more lightly over the farmer than over the merchant, the manufacturer and the artisan, and they have abundant reason to be grateful who have not felt the dire effects of the dullness of business and depreciation of values that have prevailed since our last annual meeting.

The operations of the Society during the year have been restricted to its usual routine of labour. Shortly after the last meeting, the arrangements were completed with a committee of citizens of Utica for holding the Fair at that place, and it was also decided to try the experiment of judging the implements and machines entered for prizes during the fortnight before the Fair. The reason for this action will be obvious to all who have attended the recent State Fairs and seen the difficulty of judging implements at all, and the impossibility of doing it deliberately, in the bustle, crowd and confusion of the Fair days. In fact, there were only three ways of meeting the difficulty—by having so large a number of judges that each committee should have but a few hours' work; by judging and testing the implements before the opening of the Fair; or, finally, by giving no prizes for implements, and thus obviating the necessity of any judging. The first expedient was utterly impracticable, because the large number of judges required could hardly be found and assembled at the Fair. It requires a good deal of inquiry and deliberation to select half a dozen men fit for the duty of deciding upon the comparative merits of such perfect implements as we now have, and this plan would have required half a hundred. The last of the three expedients it was thought would have, sooner or later, to be resorted to; and though an exhibition of implements and machinery, without competition for prizes, is neither without advantage to the manufacturer, nor uninstructive to the public, it is not satisfactory to a large class of exhibitors, including all who have implements of new design or invention; while it affords no opportunity of gaining the deliberate opinion of experts to guide the farmer in his selection, nor of encouraging and rewarding ingenuity in contrivance and faithfulness in workmanship by special public notice and honorable awards.

Upon such considerations the conclusion of the Executive Committee was based, and the citizens of Utica coming forward with great liberality in aid of the Society, it was arranged to have the trial of implements at the same place with the Fair, and circulars were issued to all former exhibitors and to all the manufacturers that could be reached; and, although the attendance was not so large as was expected, there was still as much work as the judges could do in the time allotted, and the result is considered extremely satisfactory, especially to the exhibitors in this department.

The expense and labour attending this plan are, however, too serious to allow of it being carried out every year, and it would seem to be the policy of the Society to hold, this season, a trial of harvesting implements, which have had no trial under the direction of this Society since 1866, and, afterwards, to offer no prizes in this department until 1873 or 1874, when a trial similar to that of last year could be had, to be followed, in like manner, by a trial of harvesting implements the next summer.

The Fair at Utica was in all respects a satisfactory one. The show of cattle was quite full; the Short Horn class, of high average merit, and including some animals recently imported, that had won honours in England; the Devons, unusually numerous and good; the Ayshires and Jerseys, fully up to the average; and there was a remarkably good ring of fat oxen and steers. Horses, in the class of breeding and growing stock, were stronger than usual in numbers and merit, but weaker than in some former years in the harness class. The new gold medal prize, for stallions accompanied by six of their produce, brought out a good entry, Mr. Thorne's Hamlet taking the prize, and Mr. Bacon's Ethan Allen, whose offspring showed both strength and symmetry, being a good second. The classes of sheep, swine and poultry, particularly the last, were well filled. The implement department was well sustained, as the judges' reports will show, no less than 63 bronze medals, which are given only for articles of high value and merit, having been awarded. The department of farm produce was rather meagrely filled, notwithstanding the large increase within a few years in the amount of money given in premiums; but in no other are the exhibitors more intelligent or more interested, and it should be an object of great solicitude and earnest effort to make this department worthy the labour and expense bestowed upon it. If this cannot be done, the question is, whether the State Fairs may not better be made great shows of live stock and implements only, leaving the exhibition of grain and other produce to the local societies.

The arrangements for the Fair, with the exception of the water supply, were generally very satisfactory, and the new buildings, especially the large one with trussed rafters and shingled roof, used one-half for the domestic goods and miscellaneous entries, and the other half for fruits and flowers, was the best ever put up for the Society.

The reports of the county and town societies and farmers' clubs, so far as received, show general prosperity.

There have been larger additions than usual to the library of the Society during the past year, both by purchase and by donations and exchanges; and the Society is under obligations to several of its members for donations of old volumes of the Transactions, whereby sets have been completed and the Executive Committee have been enabled to supply the libraries of other institutions and societies The donation by the Hon. Erastus Corning of nine copies of the very rare volumes of 1841 and 1842, is especially to be acknowledged.

The finances of the Society are in a satisfactory condition, although any great addition to the reserve fund is prevented by the large increase in the premium list and the expense attending the implement trial, notwithstanding the liberality of the citizens of Utica, who contributed towards it a thousand dollars and all the material needed for showing the machines in operation.

The consideration of the arguments put forth in the report of last year has resulted in a stronger and more general conviction of the necessity of permanent

grounds and buildings for the State Fairs, and the Executive Committee decided, in December last, to submit to the members and friends of the Society throughout the State, a proposition matured by several of its members and believed to present the only plan by which we can accomplish the end desired, viz.: the adoption of the rotatory system, with permanent buildings at several places in the State. This proposition, it is true, looks primarily to obtaining one fair ground only, but the inevitable effect will be that other cities, beside that successful in the first competition, will, one after another, offer similar accommodation. Until this happens, the Society may accept invitations for every year for which it is not bound to hold the Fair at any fixed place. The plan has been generally approved, and a bill is now before the Committee on Agriculture of the Assembly for an appropriation of fifty thousand dollars for permanent buildings, to be paid to the Society whenever the ground shall be given and accepted.

The epizootic, known as the foot and mouth disease, or *epizootic aphtha*, has this year been imported into America for the first time. It first appeared in the United States in Oneida county (in New York), in October last, but does not appear to have spread in, nor is it known how it was conveyed to that county, and it is believed to have been extirpated. In November, however, it broke out in Dutchess county, and became quite widely spread. It has since been found in some of the Long Island dairies. The State Cattle Commissioners took prompt measures to the extent of their powers under the present law, and it is hoped that serious mischief will be prevented. The Society employed the consulting Veterinarian, Professor Law, of Cornell University, to visit the infected district in Dutchess county, to bring the highest available veterinary skill to the aid of the State Commissioners. Professor Law extended his visit to other infected districts in Connecticut and Massachusetts, and made a report upon the subject, which has been published in the Society's Monthly Journal. The disease is prevailing, to a considerable extent, in Maine also; but in all the States in which it has appeared, steps have been taken to prevent its spread, and it is hoped with success. Tho disease is an annoying one, and, though seldom fatal, causes very serious loss, especially in dairy districts. The present cattle law expires during the present session of the Legislature, and the importance of the continuance of a systematic organization, like the present Commission, for the protection of our flocks and herds from the ravages of infectious diseases, can hardly be over estimated. The subject was mentioned, in terms that showed a just appreciation of its gravity, by the Governor in his recent message to the Legislature, and a bill has been prepared by a Committee of the Society, acting in concert with the State Cattle Commissioners for the re-enactment of the old law, amending it so as to supply a few defects, and providing for the expense of enforcing its provisions. Nothing but the existence of the State Commission, and the prompt measures taken under the old rinderpest act, saved our herds from terrible havoc by Texas fever, in 1868; and if the foot and mouth disease should not be extirpated, and should become, as it inevitably would, but for the precautionary measures promptly taken, general throughout the State, the losses, even by this *comparatively mild* disease, would soon be counted by millions of dollars. The wealth of the State of New York consists largely in its flocks and herds, and our agriculture is tending, year by year, more and more in this direction. The enactment of proper regulations for preventing the introduction and spread of disease, is, therefore, essential as a economic measure, to say nothing of its importance in a sanitary point of view; and to defray the cost, which never can be serious, and in most years will be trifling, of enforcing these regulations, is as wise and as necessary an expenditure of public money as any that can be imagined.

The Executive Committee has to record the death in the month of September last, of Oscar Granger, of Saratoga. Mr. Granger was one of the most useful and valued members of the Society, and had several times served as a member of the Executive Board. His industry and intelligence made him highly successful as a farmer, and his example, especially in the formation and management of his dairy farm, was a most valuable aid to the advancement of the agriculture of his county.

The death of Mr. Samuel T. Taber, the Vice-President from the second district, and associated for a long period with the present active membership of the Society, was communicated to his colleagues but yesterday. This loss is so heavy and so sudden, that they can, at this time, do no more than announce the event to the Society, reserving for another occasion the payment of a fitting tribute to his memory.

And on motion of Ex-President Conger, the same was adopted as the report of the Society to the Legislature.

The Treasurer then presented his report as follows:

Receipts.

Cash and U. S. securities from last account..	$17,977 45
Life memberships	220 00
Annual memberships	897 00
Col. L. G. Morris, for special premium	200 00
Utica subscription for implement trial	1,000 00
State Fair receipts at Utica	20,309 72
Net refreshment rental of grounds	654 00
Interest account	976 13
Miscellaneous	51 82
	$42,286 12

Disbursements.

Premiums, etc., at winter meeting	$388 54
Premiums of previous years	69 00
Salaries and clerk hire	5,150 00
Incidental expenses	586 99
Postages	467 89
Library and Museum	474 68
Printing and stationery	746 02
Veterinary investigations	162 78
State Fair expenses at Utica	6,080 46
State Fair premiums, etc	8,007 12
Cash and U. S. securities now on hand	20,152 64
	$42,286 12

Which report was accompanied by the usual certificate of the Auditing Committee.

And on motion of Ex-President Morris, the same was accepted.

On motion of Ex-President Kelly, the usual committee of three members from each judicial district was ordered, for the purpose of nominating officers for the ensuing year, and to recommend, if they should see fit, the place for holding the Annual Fair.

And the following members were, on the nomination of the members present from the several judicial districts, constituted such committee:

First District—Thomas H. Faile, Lewis G. Morris, Samuel Thorne.

Second District—William Kelly, A. B. Conger, Edwin Thorne.

Third District—Walter S. Church, Adin Thayer, Jr., John Stanton Gould.

Fourth District—W. T. Odell, I. V. Baker, Jr., Chauncey Boughton.

Fifth District—S. S. Whitman, J. M. Childs, James Geddes.

Sixth District—W. H. Bristol, John Banks, W. M. Ely.

Seventh District—James O. Sheldon, Anson S. Wood, Volney P. Brown.

Eighth District—Lewis F. Allen, Allen D. Scott, H. Bowen.

The Committee then retired for deliberation.

Notice was given by Mr. O. B. Gridley, of Oneida county, that at the next annual meeting of the Society it will be proposed to amend the Constitution, by changing the time for holding the annual meeting to the first Wednesday in January, or such other day as may then be decided upon, instead of the second Wednesday in February.

On motion of Ex-President Patrick, Miss Midy Morgan, agricultural editor of the New York Times, was invited to read a paper before the Society on the ill-treatment of cattle in transportation, and on the subject of reformatory schools.

Miss Morgan addressed the Society as follows:

Mr. President and Gentlemen :

In permitting me to speak before you, you do me an honor. In inviting me to address you, you make me a graceful compliment for which I am duly obliged. In my duplicate capacity of Agricultural editor and live stock reporter for the New York *Times*, I see hourly before me two great phases of agricultural necessity—want of skilled agricultural help, and want of rapid transit for agricultural produce. Indeed, I may add a third great need, the want of convenient marts in and close to New York city, for the sale of live stock, as also for the sale of butchers' meats and of all garden produce. During the past year over 8,000,000 head of live stock, including horned cattle, sheep and swine, were sold in the following marts: 100th street, Communipaw, Weehawken, Chamberlin's yards, 48th street and 40th street markets. One and all of these yards are more or less badly constructed; they are too hot in summer and too exposed to severe weather in winter. From these causes the animals in them lose weight, and thereby lose value. The cattle transit of this country is a thing to wonder at; cattle trains never arrive on time; the animals often die and always become much deteriorated from being kept too long on the cars without food or drink or rest, and in hot weather often become crazed before they reach their destination. To me it seems that the moment has come when it would pay the farmer better to slaughter his cattle at Abilene or Chicago, and forward them for the cool months of the year in properly constructed cars, than to be subject to the losses entailed by the present ruinous system; and in hot weather improved cattle cars and rapid transit by night should be resorted to. The best manner to meet the want of skilled farm help, is to establish Reformatory schools, where vagrant children should find a comfortable home and a course of agricultural education. All large cities overflow with a surplus and consequently dangerous population. On reliable information, I am led to believe that it costs in a general way $2,000 to hang an adult felon. Now, I think it would be wiser to spend a like sum in educating infant vagrants, who, if not so cared for, may become objects fit for the exercise of the hangman's craft.

In relieving cities of wandering children, a double benefit is secured, taxation is lowered, and the farmer is facilitated Such an Agricultural reformatory school as I would inaugurate, under the auspices of this Society, should embrace many departments, at the head of each of which should stand a competent working man; and as I consider that it is especially woman's province to create domestic happiness, I am desirous to be the Matron of this Rural Home.

I am no Legislator, but I trust that I am a law-abiding woman. To me it matters not whether a man dies worth $5,000 or worth $100,000, so that he has spent a useful, valuable life. Better does it appear to me to own stock on the boundless prairies, to own flocks and herds, than to own stocks in Wall street. There is to me a woful love of city excitement in young Americans; therefore any system that would turn the current of youthful life into the free and pure channels of agricultural pursuits, would in itself be a blessing to society at large. If this Society can aid me in this matter, I shall hope to give back to the world many useful citizens, saved, so to speak, from moral loss and human degradation.

Gentlemen, I thank you for your polite attention.

On motion of Mr. F. Morris of Westchester, the thanks of the Society were tendered Miss Morgan for the able paper read by her, and a copy requested for publication in the Journal of the Society.

Mr. Frank D. Curtis of Saratoga, offered the following resolution:

Resolved, That it is the sense of the State Agricultural Society, that vagrant children and juvenile criminals may better be cared for upon reformatory farms, so that they may be fitted for rural labor and for household domestic service than in asylums on the present system.

On motion of Mr. John R. Garretsee, of Monroe, the following was substituted for the original resolution:

Resolved, That this Society approve of the plan of a reformatory farm, on which children—boys and girls—shall be taught the principles and practice of agriculture, and of domestic economy as best exemplified in good housekeeping, and do most heartily endorse the sentiments of the paper read by Miss Morgan.

And the resolution was then laid upon the table for further consideration.

On motion of Mr. Curtis, it was, *Resolved*, that the Society approve of the existing law for the prevention of cruelty to animals, and hope that the same may not be repealed.

The nominating committee reported by their chairman, the Honorable William Kelly, the following list of officers:

President—RICHARD CHURCH of Allegany.

VICE-PRESIDENTS.

1st district	—	THOMAS H. FAILE, JR., of New York.
2d	"	EDWIN THORNE of Dutchess.
3d	"	JURIAN WINNE of Albany.
4th	"	FRANK D. CURTIS of Saratoga.
5th	"	JAMES GEDDES of Onondaga.
6th	"	WILLIAM M. ELY of Broome.
7th	"	BENJ. F. ANGEL of Livingston.
8th	"	HORACE S. HUNTLEY of Cattaraugus.

Corresponding Secretary—THOS. L. HARISON of St. Lawrence.

Recording Secretary—WILLIAM H. BOGART of Cayuga.

Treasurer—LUTHER H. TUCKER of Albany.

Executive Committee—ADIN THAYER, JR., of Rensselaer; MILO INGALSBE of Washington; FORDHAM MORRIS, of Westchester; ROBERT J. SWAN of Seneca; HARRIS LEWIS of Herkimer; GEORGE H. BROWN of Dutchess; JOSEPH JULIAND of Chenango; JOHN L. COLE of Wayne.

And recommended that the selection of a place for the next State Fair be referred to the Executive Committee; which report was accepted, and a ballot being had, the officers nominated by the said committee were declared duly elected.

EVENING MEETING.

The Society re-assembled in the Assembly Chamber, at half-past seven o'clock.

An address was delivered by John R. Dodge, Esq., of the Department of Agriculture, on Sheep Husbandry.

On motion of Ex-President Gould, the thanks of the Society were voted to Mr. Dodge, and a copy of his address requested for publication.

James Law, Esq., member of the Royal Veterinary College of England, Professor of Veterinary Science in Cornell University, and Consulting Veterinarian to the Society, delivered a lecture on the principles of the breeding of animals, and,

On motion, the thanks of the Society were tendered Professor Law, and a copy of the lecture was requested for publication.

THURSDAY, FEBRUARY 9TH.

The Society convened in the Lecture Room at 10:30 A. M., President Church, presiding.

The report of Mr. J. B. Lyman of New York, Chairman of the Committee on the subject of Marketing Farm Produce, was presented and read, and a paper was read by Mr. Frank D. Curtis, on Farmers' Homes.

The Society then adjourned.

WINTER EXHIBITION.

REPORTS OF COMMITTEES.

Field Crops.

John Stryker, Rome, Oneida County, exhibited sample of a crop of corn grown upon 5 acres of land. Expense of cultivation, $90.75; receipts for 482¼ bushels, $410.90; estimated value of the stalks, $125. Profit, $345.15. Premium, $25.

STATEMENT OF CULTIVATION.

Richard H. Jones, manager of the farm of John Stryker, and residing thereon, states that he planted about 12 acres of corn on a lot on said farm, which had been used seven years for pasture, and which is situated on the Floyd road. The land is a gravelly loam, and had no underdraining; there was no manure applied, and it was first ploughed in the fall of 1869, seven inches deep and eleven inches furrow. The ground was planted May 18, 1870, with 12 rowed Dutton corn, three feet apart, with from four to five kernels in the hill, and left about four where it exceeded that number. The corn was hoed twice, and the cultivator used three times. Five acres were surveyed off the southwest corner of the field. The crop was cut the first week in September, and shelled the first week in January. The stalks weighed 24,948 lbs., estimated at $10 per ton (being half the price of hay.) The yield of corn was 25,200 lbs., or 86 9-10 bushels per acre.

JOHN STRYKER.

John Stryker, Rome, exhibited sample of a crop of potatoes grown upon 1.35 acres of land. Expense of cultivation, &c., $30.50; received for 575 bushels, at 50 cents, $287.50. Profit, $257. Premium, $20.

STATEMENT OF CULTIVATION.

I raised the past season, upon 1.35 acres, 575 bushels of potatoes of good quality; being 425.9 bushels to the acre. Soil, gravelly loam, in good state of fertility. The land was used seven years for pasture, and was ploughed in the fall of 1869 and planted May 5, 1870, with 17 bushels of rough Chili potatoes, two pieces in each hill. Cultivated often after coming up, and thoroughly hilled about July 1st. Dug, carefully measured and sold the first part of October, at 50 cents per bushel.

JOHN STRYKER.

Grain and Seeds.

Winter Wheat—1. M. E. Myers, Charlton	$3 00
2. H. Pine, Pittstown	2 00
Spring Wheat—1. H. Pine	3 00
Rye—1. H. Pine	3 00
2. A. E. Van Allen, Bethlehem	2 00
Barley, two-rowed—J. J. Deforest, Duanesburgh	3 00
Oats—1. G. W. Bender, New Scotland	3 00
2. H. Schoonmaker, Cedar Hill	2 00
Yellow Corn—1. H. Pine	3 00
2. J. J. Deforest	2 00
White Corn—1. Zerah Rider, Cambridge	3 00
Large Peas—1. L. L. French, Richfield Springs	3 00
Large White Beans—1. H. Pine	3 00
2. A. E. Van Allen	2 00
Small White Beans—1. L. L. French	3 00
Kidney Beans—1. L. L. French	3 00
Yellow Beans—1. J. J. Deforest	3 00
Timothy Seed—1. G. W. Bender	3 00
Flax Seed—1. H. Pine	3 00
Buckwheat—1. G. W. Bender,	3 00
2. H. Schoonmaker	2 00
Early Somersetshire Oats—O. K. Rice, Granville	Hon. men.
Eight and twelve-rowed Corn—H. Schoonmaker	Hon. men.
Collection of roots—D. W. Seely	5 00

JAMES L. INGALSBE,
LEWIS SHERRILL,
R. H. JONES,
Committee.

Butter.

For three packages made at any time—	
1. A. B. Benham, Cortland	$15 00
2. John Stryker, Rome	10 00
3. M. E. Myers, Charlton	Trans.
For three packages made, one in June, one in August, one in November—	
1. A. B. Benham	$15 00
2. John Stryker	10 00
3. M. E. Myers	Trans.
For a package of winter butter—	
1. John Stryker	$5 00
2. Harvey Pine, Pittstown	3 00
3. L. L. French, Richfield Springs	Trans.
Zerah Rider, Cambridge	Commended.

Cheese.

3 Cheeses—1. M. E. Myers	$15 00
1 Old Cheese—M. E. Myers—Discretionary premium of	10 00

Honey.

M. Quimby, St. Johnsville	Hon. men.

JOHN THOMAS,
R. W. PRATT,
Committee.

Fruits.

20 varieties of apples—1. Peter Van Wie, Bethlehem	$10 00
2. H. Pine	5 00

10 varieties of apples—	1. G. W. Bender........	$5 00
	2. H. Pine..........	3 00
	3. Peter Van Wie	Trans.
Best dish of apples of one kind—	1. G. W. Bender.	5 00
	2. A. E. Van Allen	Trans.
Best seedling apple—	Peter Van Wie............	5 00

W. H. BRISTOL, Owego,
O. B. GRIDLEY, Deansville,
L. RAMSDELL, Greenville,
Committee.

Implements, &c.

Syracuse Agricultural Works. Hubbard mower and self-raker.

There are some novelties in this machine, which we describe: 1st. There are two motions, either of which can be adopted at pleasure; the first gives 18 double or 36 single vibrations of the knife for each revolution of the driving wheel; the second motion gives 27 double or 54 single vibrations. This is really a very decided advantage. 2d. There is a reduction in the number of the cogs to 180. 3d. The motion is communicated through two sets of spur and one pair of bevel wheels. 4th. No part of the shafting is exposed to dust. 5th. The ratchets and pawls are removed from the driving wheels, and three of them are placed inside of each of the spur gears. 6th. The platform can be raised or lowered at pleasure, so that the cutting edge remains parallel to itself at all times. 7th. The driver's seat is hung upon two springs which can be advanced or receded through a space of twenty-two inches, in order to adapt it to reaping or mowing.

These points are all claimed as novelties by the maker, though the judges are not quite confident that some of them are so. Not having made actual trial of the machine, the Committee do not feel competent to express any decided opinion on its merits, except to say that its mechanical execution reflects the greatest credit on the makers.

Bristol & Robbins, Owego. Seed drill.

This seems to be an excellent implement, but as there has so recently been an actual trial of these implements, we refrain from any further expression upon the question.

John G. Talbot, Sloansville, N. Y. Dash churn attachment.

A horizontal plate of iron is fastened to the shaft of the plunger by a pinching screw; this plate is penetrated by a slot through its entire length. A wheel, having its step fastened to the edge of the churn, has a slot in one of its arms, in which a tooth slides backwards and forwards, and is kept in any desired place by a pinching screw; this is engaged in the slot on the shaft of the plunger; by this arrangement the length of the stroke may be altered at pleasure. The advantage of this arrangement is, that a reciprocating motion is converted into a continuous one, and the necessity of working at arm's length is obviated. It is very simple in its arrangement, and is also durable and cheap. We are inclined to believe that it will prove a very useful assistant to the dairy-maid.

Eureka Butter Worker. J. P. Corbin, Whitney's Point, N. Y.

This is an arrangement of a universal joint, by which the ordinary butter ladle is made to press upon the sides of the bowl and thus work out the buttermilk; the bowl itself may be wheeled round at pleasure, and the buttermilk can be emptied as often as is desired. The whole arrangement is cheap, simple and durable, and we are inclined to look upon it with much favor.

G. W. Edgcomb, Lima, N. Y. A Pruning Shear.

This is so arranged that when the handle is drawn downward, the jaws of the shears close by an arrangement of levers. It has occurred to us that, in drawing it downward, there may be danger of breaking the limb, but as we had no opportunity of trying it, we cannot determine the point.

Horace L. Emery, Albany, N. Y. Clark's Patent Sectional Boiler. Manufactured by Clark & Utter, Rockford, Ill. No. 1, $65, without jacket; $80 with jacket. No. 2, $120 and $140.

The No. 2 boiler exhibited is 20½ inches in diameter, and the depth of the sections is 8½ inches. They are of cast iron corrugated on the interior, so as to give a very large amount of fire surface; the lower section is an ashpit; the second a fire-box; the remainder are the corrugated surfaces filled with water. The coal is put in from the top, and passes down, through a magazine in the centre, to the fire-box.

The boiler is supplied with water from a reservoir on the exterior; the steam from the boiler enters the top of the reservoir through a pipe, and it must therefore be strong enough to bear all the pressure on the boiler; the cold water enters the boiler from the reservoir, through a pipe in the lower part, by means of a cock and a check valve, which permits the cold water to flow into the boiler, but prevents the flow of hot water into the reservoir The position of the water in the boiler is indicated by a glass tube on the outside. The sections are planed down on the edges, and India rubber packing is placed in the joints; the lower edge of the section is furnished with a lip which prevents the blowing out of the packing.

We are very favorably impressed with the apparatus. The only doubt of its efficacy that has occurred to us is the danger of incrustations of the boiler by lime water, which would impair the conducting power of the heat.*

Egg Carrier. D. W. Seely, Albany, N. Y. Price, $10.

This consists of a series of trays 2¼ inches deep, which are divided by means of stiff papers into compartments 1½ square; these papers are perforated with holes which carry four cords, upon which the end of the egg rests, as on an elastic cushion. There is a coarse cloth nailed over the bottom of each box, which rests upon the upper ends of the eggs in the tray next below it. There is a nest of shallower boxes on the top, and when the eggs are to be taken out the tray is turned bottom upward upon this, and they are then very easily removed. There are 12 dozen eggs in each tray, and 9 trays in each box. By this arrangement the eggs are always kept on end, they never touch each other, and are always on an elastic cushion, which pretty effectually resists breakage. We are of opinion that this is a valuable contrivance, and that it meets a real want of egg dealers.

Driving bit. S. C. Boughton, Waterford, N. Y.

This seems well adapted to restrain a vicious and unruly horse; but it is not claimed that it is adapted

* The inventor claims that the sections used in the central portions, the next to the lowest as fire chamber, and the lowest as ash-pit, both being filled around the fire chamber and ash-pit with water, and constituting part of the boiler, and the water in the lowest section being comparatively at rest, the deposit, if any, will always be in this section and can be blown out when desired, and that this device makes the apparatus peculiarly free from liability to incrustation.

to horses not vicious. It is adjustable to different grades of severity by changing the buckle on the strap.

JOHN STANTON GOULD,
DANIEL DONCASTER,
Committee.

EXECUTIVE MEETING, NEW BOARD.

FEBRUARY 9, 1871.

Present: The President; Vice-Presidents Winne, Curtis, Geddes and Angel; the Secretaries; Messrs. Thayer, Ingaldsbe, Thorne, Morris, Swan, Lewis and Juliand of the Executive Committee, and Ex-Presidents Faile, Gould and Allen.

The following Judges were appointed for the winter exhibition this day, viz.: on

FRUIT—O. B. Gridley, Deansville.
W. H. Bristol, Owego.
GRAIN—R. J. Swan, Geneva.
Lewis Sherrill, Greenville.
R. H. Jones, Rome.
DAIRY—R. W. Pratt, Greenwich.
John Thomas, Deerfield.
IMPLEMENTS—John Stanton Gould, Hudson.
Daniel Doncaster, Albany.

On motion of Vice-President Curtis, it was

Ordered, That fifty dollars be paid to Mr. Dodge, for his travelling expenses.

On motion of Vice-President Geddes, it was

Resolved, That the Corresponding Secretary be designated as the acting Secretary of the Society, with the same salary and allowance for clerk as last year, and that the salary of the Treasurer be the same as last year.

On motion, the President, Secretary and Treasurer were appointed a committee to arrange for holding the Fair.

On motion, Colonel H. Bowen was unanimously elected General Superintendent.

The Committee then adjourned.

A BETTER MARKET SYSTEM.

Paper read before the New York Agricultural Society, BY J. B. LYMAN.

At one of the evening discussions at Utica, last fall, this subject was handled for an hour or more, and among the suggestions was a recommendation that a Committee be appointed to look into the mischiefs of the New York system, and to recommend measures by which the farmer will get better prices and the consumer may purchase better food at more reasonable rates. In considering the topic in hand, we find two classes of traders in the surplus of farms—the produce and commission merchant and the middle-man. In the criticisms we may make upon the middle-man we wish at the outset to discriminate sharply between these two. One is necessary: the other is not. One is important; the other is an impertinence. The fair and honorable produce merchant is as useful to the farmer as the depot that shelters his wagon-load, the freight line that takes it to tide-water, or the bottom in which it is wafted over seas. Of *course*, there must be cheese-merchants, and wheat dealers, and wool houses; and these traders must have their margins and win their gains, for they have disasters to survive and losses to pay. For the honorable, high minded men who conduct the great exchanges of the world, we have no feeling but that of admiration, and no words that are not words of approval. Our criticism falls mainly on a class of men that live by their wits; that impede distribution rather than aid it; who work for selfish ends, and generally by unfair means.

WHO IS THE MIDDLE-MAN?

In general he is a person who acts between farmer and consumer, and, like the monkey dividing cheese between the cats, his policy is to bite from one, and then gnaw a little from the other, till he gets more cheese than either of the cats. There are those who say that middle-men are a great benefit to the farmer, and the more of them there are, the better prices the producer will receive. Let us examine this proposition a little and see if it will hold water. There are perhaps a million of men who own land, and produce from it more than they consume at home, and who look to New York as the best market. Grant that 500 men are *needed* in New York to deliver that surplus to the consumers, and who must receive their pay from a moderate commission for handling Now, double the number, and let 1,000 men push each other, and jostle and trick and lie and swear, as they do, in order that each may have the handling of a part of that surplus. To the farmer this eagerness may seen like an active demand, and he may believe that it indicates good prices, and that the 1,000 jostling middle-men have by their enterprise and thrift made his market. Is not the truth just here, that the extra 500 who are not really needed to handle this surplus must live, and that that living must come from the consumer and the farmer—sometimes more from one and sometimes mainly from the other, and, in the end, the worker in the city and the worker in the country have that 500 to support, and often to support in all their extravagance, to pay their losses, to foot their bills for drink and tobacco, sometimes to give them a greedy profit, and enable them to retire from the wharves and to give place to others as eager and as unscrupulous? Why cannot the farmer do his own marketing, and thus save what goes to middlemen? As business is arranged at present in the metropolis, this would be impracticable, and we give some reasons:

1. Two of the great railroads that bring supplies into New York—the canal and its continuation, the Hudson—run for nearly 200 miles through a country that gives but little surplus. There is some strong productive land on the Hudson, but the local population, largely non-producing, consume the bulk of it On the Erie, one reaches Binghamton, and on the Central, Schenectady, before coming into a country that yields a large surplus. Probably the county of Orange, in the matter of milk and butter, should be mentioned as an exception. Thus, the farmers of Central and Western New York are divided by half a day's car travel, and a fare of at least $4, and often $8 each way, from the people to whom he would sell his grain, veal, cheese, apples, butter, honey, poultry, eggs, feathers, beans, and potatoes. He cannot afford to spend from $10 to $20 in going to market with a lot of produce which may be worth all told not over $200. This is difficulty No. 1, and it is insurmountable.

2. New York has legislated and established customs, all in the interest of the city and its middle-men, and adverse to the farmer.

For instance, suppose a farmer in Greene county has a fine new milch cow to sell; he reads in his newspaper that prime milch cows are bringing from $70 to $90, and some as high as $100 and $120. He puts her on the boat, and goes down with her. Soon after he passes Spuyten Duyvil a person steps aboard and comes up with the air of a man of business, and praises the cow, and says, "I want that animal for my family use. She is gentle?" "O yes." "How old is her calf?" "Four weeks." "All right; I'll go right up to the house, and send my man down to the boat for her. How much did you say?" "One hundred dollars." "All right; a good cow is worth $100 in any family."

The farmer is elated; he has sold his cow, before the boat had her lines out, at the highest price his fancy painted. He waits an hour; no man. Another hour; nothing from the nice gentleman that wanted a family cow. Soon the mate tells him the cow must leave the boat. He takes her out on the wharf, and stands there till afternoon, holding her, tired and worried, and fretted and hungry, both man beast, till at last another "man" comes up, asks if that cow is sold. Farmer tells his story. Man asks him to describe the gentleman who was such an early purchaser. "Oh! he—he's a dead beat; you'll never see him again. I'll tell you what I'll do. I'll give you $75 for that cow, and if you don't sell her to-night it'll cost you $10 to $15 to hold her another day; $75 is about all you can make on her above expenses if you should sell for $100 to morrow." Poor worried farmer, he yields! Both jaws of the trap take him at the ankle, and these two men work together just as even and venomous as the bows of any steel trap that ever nipped the leg of a woodchuck. This is only one instance in a thousand, and it is part of a great system for discouraging and overreaching farmers.

REMEDIES SUGGESTED.

He who discusses a wrong should urge something by way of righting it. Your Committee do not suppose that any one enactment will effectually cure the mischief. The farmer, *acting alone*, can do much toward a better state of things; the farmers, *acting in concert*, can accomplish much in that direction, and a little good *legislation*, if duly executed, will greatly aid private endeavor.

What the Single Farmer can do.—Let him forward his produce in packages that are perfectly honest, putting big apples in the middle of the barrel as well as at the ends, keeping straw and weeds and corn-stalks from the middle as well as from the hoops of his hay-bales. It is always a brass shilling that a man makes by a trick in packing. If he has a good name on the wharves, such deception kills it, and he will work twice as hard and wait twice as long to regain an enviable repute as it requires to win it at the outset Let him be wise also in classifying his loads, and send, if possible, only one grade at one shipment. For instance, suppose a farmer living on the cool clays of Niagara or Wayne county sends to New York 10 barrels of soft fall apples, and in the same lot five barrels of No. 1 Spitzenburgs. On reaching the wharf, the merchant sees that the soft apples must be sold at once; perhaps he trades right away with a pie-maker at $1.25 a barrel. This little lot of Spitzenburgs he knows will keep till March, but he is dealing in fall apples; the buyers of hard apples are not in market; he offers them to the pie-maker for $1.50, and he takes them. The farmer could have got $2.50 or $3 for those hard apples if he had kept them to mid-winter, or sent them with a large lot as soon as freezing weather is over. This is an illustration of the mistake that farmers make in apples; they use the same indiscretion in butter, cheese, dried fruit, eggs, and poultry. Most of the New York merchants do a driving, not to say a slapdash business; large sales and large profits, if they can get them—large *sales* any how. This vice of the metropolitan system should be understood by the farmers and provided against. Classify at home; send No. 1 butter in good company—fat chickens with fat chickens, and big, red apples only with such as are big and red and hard. Let the single farmer, unless his means are very limited, go to New York as often as once a year, and make acquaintances among the commission merchants and learn the ways of the metropolis. He may hit upon some worthy citizen who will offer to give him 60 cents the year around for 10 pounds a week of sweet yellow, firm-grained butter, who will take his honey, his lard, his jellies, his currant wine, his maple-syrup, his fresh-laid eggs, and his plump chickens, at good figures.

2. *What concerted action may accomplish.*—The farmer's life is often praised because it is so independent. When that independence amounts to isolation and a refusal to coöperate with his neighbors, his independence is something like the liberty of Billy Bowlegs or Spotted Tail—a barbarous freedom that strips him of half his comfort and his possible gains. There are hundreds of towns in which the principal profit for four or five months is from butter. Each dairy makes after their own fashion: the rolls are kept under cloth in a cool pantry, till about 50 pounds are saved. It is then rammed into an oak or hemlock keg, set into the front end of the sleigh and taken to a depot, and shipped to a great butter house on Front or Water street. Arrived, the long steel gauge is pushed through it, and the tub or keg goes with 50 others, at a single taste, and at wholesale rates, and *the poorest ball of butter in that tub gives price to the whole.* Now, suppose a dozen butter-makers were to act in concert, appoint one of their number to classify the balls, and pack No. 1 with nothing but No. 1. In this way 10 kegs might be collected, 8 of which would be of the finest quality. If these families had a friend in New York, or should send a good market-man from their number, he could engage these 8 tubs at the highest retail prices. Ten cents a pound on 500 pounds would give $50 as the gain from this concerted action in the sale of one article. Farmers' Clubs are organizations through which much of a purely business character can be accomplished. Before the discussion of the evening is taken up, appoint a committtee and vote him a small sum for his expenses; his time in winter he can afford to give for a mutual benefit. Send him to New York with instructions to learn how the farmers composing the Club can obtain the best prices for their eggs, poultry, butter and dried fruit. Send the best business man you have and let him act for all with the same sagacity and wisdom that he displays in the management of his own affairs. I will not believe that such qualities are not to be found. The greed of the metropolis is creeping outward I know, and shooting its virus into the redder veins of rural manhood; but there are great arteries in the body politic that as yet, thank God, are pumping only *pure* blood, supplying brains that are clear to see right, and hearts that are warm in the love of virtue and honor. It is not impossible to send to the Assembly men who are quite superior to a percentage or a bonus or a job. Such men will see that no class deserves the fostering care of law-givers so much as the order that is fundamental and indispensable to all the rest, the order without whom the engineer must box his theodolite, the merchant lock up his warehouse, the lawyer burn his red tape, and the editor chew both ends of his quill. When the farming interest is duly represented in our Assembly, when working producers outnumber talking men and ambitious men and lobbyists, and the hunters for soft places, you will have laws regulating business on city wharves; by which wheat-sowers and bakers will be brought face to face; the housekeeper will see the very hands that do her churning, that handle the curds for her table and cook the delicacies which she reserves for the end of her banquets. Such legislators will draw the wind from the craft of our middle-men, their occupation will be gone; necessity will force them to eat honest bread or to go hungry.

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May 8.

THE JOURNAL

OF

The New-York State Agricultural Society.

VOL. XXI.] ALBANY, MARCH AND APRIL, 1871. [NOS. 3 & 4.

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Mechanical and Consulting Engineer—HENRY WATERMAN.

Consulting Veterinarian—Prof. JAMES LAW, M. R. V. C.

State Agricultural Rooms.

The Secretary's Office is in the New Agricultural Hall corner of State and Lodge streets, Albany.

New-York State Agricultural Society.

EXECUTIVE MEETING, APRIL 28, 1871.

The Executive Committee met at the Agricultural Rooms, at Albany, on Friday, April 28, 1871, at ten o'clock A. M.

There were present, the President, Vice-Presidents Faile, Winne, Curtis; the Corresponding Secretary, the Treasurer; Messrs. Thayer, Ingalsbe, Swan, Lewis, Juliand and Cole of the Executive Committee, and Ex-Presidents Gould, Faile and Campbell.

Letters and excuses for non-attendance were received from Vice-Presidents Thorne, Geddes, Ely, Angel and Huntley, and from Mr. Morris.

The minutes of the last meeting were read and approved.

The President, from the Committee to arrange for holding the Fair, reported that the subscription to the fund for holding the Fair at Albany was not completed, and on motion, the Committee was continued with the recommendation, that if the Albany subscription be not made up within one week, they endeavour to make other arrangements.

On motion, the applications of the Illinois State Agricultural Society, Illinois State Industrial University and Missouri Agricultural College, for volumes of Transactions of this Society, to complete sets, were granted; and the Secretary was authorized to give to the Virginia State Agricultural Society, a set of the Transactions, or such volumes as are not in the library of that society; and to the Mercantile Library of Brooklyn and the Library of Columbia College such volumes as they have not and that can be given without breaking sets.

The following officers were assigned to the charge of the several departments of the Fair, viz: Cattle, Mr. Swan; Horses, Mr. Brown; Sheep, Mr. Juliand; Poultry, Mr. Curtis; Implements, Mr. Geddes; Grain, Mr. Ingalsbe; Dairy, Mr. Lewis; Domestic, Mr. Cole; Fruits and Flowers, Mr. Angel.

The question of holding this season a field trial of mowers, reapers and other harvesting implements was discussed, and it was decided not to undertake it.

The Committee proceeded to revise the list of premiums, and made several amendments thereto.

On motion, it was *Ordered*, That the list of premiums for merino sheep in two classes—those bred for weight of fleece and those bred for fineness of wool—in the premium list of 1869, be restored to the list for the present year, and that a committee be appointed by the President to consider the subject of the classification of merino sheep, and report thereon.

On motion of Ex-President Gould, it was *Ordered:* That a premium of one hundred dollars be offered for a thorough trial of the Lois-Weedon system in this country, and report of the results thereof.

On motion of the same Ex-President, the following minute and resolution were adopted:

Whereas, The death of our late greatly esteemed friend and associate, Samuel T. Taber, Vice-President of the Society from the second district, was announced at our last meeting, but at too late a period of the session to take suitable action thereon, the Board desire at this time to place upon record their sense of the excellent personal and official character of the deceased.

He was an intelligent and successful farmer, not only

desirous of advancing his own interest by the cultivation of his land, but anxious to diffuse the benefit of his experiments and successful practice among his agricultural brethren throughout the State and nation.

He was an active and judicious friend, of enlarged agricultural education, and his labours in this direction were of the highest value.

His services as a member and officer of this Society were arduous and valuable, rendered at all times freely and ungrudgingly, and characterized by the utmost good sense and sound practical judgment.

His relations with his colleagues were invariably pleasant; he was always ready to take his full share of labour and responsibility, and his uniform courtesy and kindness endeared him to all who were brought in contact with him.

The Board feel his loss most deeply, and desire to offer their warmest sympathy to his bereaved family.

Resolved. That the Secretary be directed to transmit an attested copy of this minute to the family of Mr. Taber.

On motion, it was *Ordered:* That a committee be appointed to prepare a suitable minute in relation to the decease of Sanford Howard, Esq., late Secretary of the Michigan State Board of Agriculture, and long intimately connected with this Society.

And, on motion, the Committee adjourned.

FARMERS' HOMES.

Paper read at the Annual Meeting Feb. 9, 1871, by Frank D. Curtis, of Saratoga county.

It is very often the practice with farmers to think more of the farm than of the farm house. It is a time-honored adage that, "charity begins at home;" hence, we think that a few suggestions correlative to this sentiment may be profitable. There is a feeling of dissatisfaction with agricultural life among the sons of farmers, leading them to hate the occupation and surroundings of their fathers, and to seek a society and business which their fancy paints to be more congenial and less laborious. Farming is hard work at the best, and when it amounts to abject drudgery, with no sunshine in-doors, and the grateful cheer of books, intelligent conversation, and encouragement to the promptings of latent ambition, not to omit good food and a pleasant home upon which the eye delights to rest, it is no wonder farmers' sons and farmers' daughters become restless, and long for the time to come when they can throw off the shackles of an unsatisfying servitude, and go to the factory, the store, or an overcrowded profession, where they can enjoy some of the privileges which they do not have at home. The remedy for this, is to make home pleasant and enjoyable. Do not enrich the field and impoverish the household. Apply every exertion in culture and drainage outside the home, but do not neglect to sweeten the inner atmosphere, and strengthen the ties within, so that from the intelligent happiness of the home circle, there may always radiate a cheerful and intelligent, and therefore effective, energy.

Children must be made to *love* their homes, else the attractions of cities and villages will surely lure them away from the peaceful and monotonous labors of rural life. Let them plant trees, cultivate them, and have the profits accruing from the sale of fruits they bear. Let them have fowls, animals, bees of their own, be taught how to rear and care for them, and enjoy the results of their attention and work in toys or books, or investments in the Savings bank. The sense of proprietorship will give to a boy not fond of work, great interest in a small potato patch, or a score of sage plants, or a rod square of Lima beans. And in our country girls, a love for out-of-door work should be sedulously cultivated. Let them have a garden spot, with room for flowers, herbs and vegetables, and time to take care of it. Better raise flowers and shrubs and fowls and honey, than delve in the kitchen forevermore, and then have nothing for it.

Ample provision must be made for sport during the short winter days and the long cold evenings. Checker boards, candy pullings, games of various sorts, music, amusing books, these are indispensable. Let the boys have traps and catch minks and muskrats, rabbits and skunks, the more the better. Let the boys and girls have sleds and skates with wrappings and furs of their own trapping, and enjoy the glare of frozen ice, the slippery side hill, the glowing starlight, the jingling bells, the bracing frosty air, and all the delights that make winter on the farm a season of festivity and sport. Then do not keep all the preserves and canned fruit, the various goodies laid up in store, only for company; but bring them out on proper occasions, just to let the boys and girls have a good time eating them, and they will be more ready in hot days next summer to renew the wasted store, and lay up future enjoyments for the coming snows and frosts.

Then remember that any right-minded boy or girl always likes to know the reason of things. Explain to your son when you are sowing clover for manure, how and why it benefits the soil. Why some soils require lime, and others the acids of decomposition, to render them mellow and fertile. If the children are contented and happy, the young folks will be.

Let the boys earn money, and give them the benefit of your *advice*, not *commands*, how to expend it. Make the boy a man and the girl a woman as far as you can, not a drudge or a fool, by being yourself the mouth to speak for them, the eyes to see for them, the ears to hear for them, and the brains to think and act for them. Let them act for themselves under your care and supervision. Try to know more than they do; spend your own surplus time in informing yourself, laying up a store of knowledge to impart to them, instead of gossiping with some talkative neighbor, or telling over for the hundredth time some pig story or affair which never had any pith or point, and which your son hears, wondering how you can be interested in such nonsense, when the wide world is before him, and nature, whose laws and phenomena are to him an enigma, is all around him, and you should be, and he expects you to be, capable to explain many of these things to him. Live, if possible, in the front side of the house, where something can be seen. Do not have all the grand and comfortable things in the parlor, which is opened quarterly, when the minister comes around, and the rest of the time is sacred, unless there is a funeral or a wedding, which the girls would not postpone a great while in such a home; but have some of the cheery and nice furniture in the sitting or family room. Be sure and have such a room, if you have to do without the parlor; and have a place for books, and have some books there. In addition to what we should always expect to find, a Bible, and an almanac and histories, let there be agricultural papers and books. Much can be learned from them how to prevent disease among the animals, how to cure disease, and hints and facts about the crops, which will more than repay the cost, besides

furnishing food for the hungry minds of the boys and girls.

The surroundings of the farmer's home can be made more comfortable. Instead of the little building situated several rods from the house, which must be visited in the storms and cold and exposed to the public gaze, and which is very often a nuisance, let a lean-to be made against the rear of the dwelling or the wood-house, with an entrance under cover, where tubs can be placed, and by an addition of a little earth or plaster or muck every few days, nothing disagreeable will ever be experienced. The compost heap or the manure pile will receive the contents, and at least $10 annually of additional value will be realized for each adult. Have a cistern; gather the materials at odd times, and if you have room in the cellar, and do not want to afford time to dig a hole, wall up one corner and let the water in. Put a pump in the kitchen in the handiest place, and with a lead pipe you may draw the water to a sink within a step from the stove. Keep a stock of wood ahead. Any wife has a just reason for divorce from a husband who is so mean and so shiftless, that he furnishes her stove wood from day to day, and any farmer who does it with the idea of economy, is a dunce, for the time spent in hunting up the axe, and such a farmer always has to hunt up his axe or anything else he wants, and the time spent in going to and from his other work, to cut wood; and the delays waiting for meals, because the wood is green and wet, would go a long way towards working up a good stock of wood, which, being seasoned and handy, the hard working housekeeper could use so as to save herself many a scolding; and a man who has no wood pile must be a scold, and unreasonable enough to find fault with his wife, when he alone should be blamed. Pork is the most expensive food, besides its tendency to make people gross and vulgar. A big pork eater and a man of delicate sensibilities and feelings are opposites. A pound of chicken can be produced on a farm as cheaply as a pound of pork. The same is true of mutton. Both are healthier than hog flesh. Then why not raise chickens and lambs, and eat poultry and mutton?

An ice house is indispensable to a well regulated farm house. The best way to build one is to construct an addition on the north side of the kitchen or wood-house and connect with it a dark room to be used for a store room. This room having the ice on one side, with only a partition between and no window or ventilation except at the top, would always be cool and free from flies. Here the fresh meats and the cream and other things can be kept cool and sweet. To be handy, the ice could be taken out from the ice house through a door opening into this room, and be closed on the outside all the year except when it was necessary to be open in order to put the ice in. The first cost of this addition would be but a trifle, and the expense of getting the ice nothing at all, for the farmer could do all that himself.

A nice house, with the road side in front of it the favorite place of deposit for all the broken dilapidated crockery, tin ware, and debris of the farm, is a common sight, and presents a contrast which demonstrates that the lady who presides within has no proper appreciation of the "fitness of things." Every body likes the sweets of neatness, and the home is pleassanter if neat. Banish the swill barrel from the kitchen door and in its stead have two large pails, and a rule, which every man and boy must obey, to empty them when full into the swill barrel, which, shall constitute part of the furniture of the pig house. A clean cellar, airy and free from odors, is health.

A house on a hill with no tress around it, looks cheerless and unhomelike. Have grounds around the dwelling. Tear away the fences, they cost money and are useless. I mean the fences shutting the house up as if there was danger of its running away. Let there be not less than an acre of door yard, ten will be better. Make a rich lawn of this and cut the grass. It can be no waste, but it will be a thing of beauty, and "a thing of beauty is a joy forever." There need not be any loss to be tasteful; nature and beauty are synonyms; good taste and economy can therefore be made handmaids to each other. Set out fruit trees in this enclosure and dig around them with a spade each year, and top dress the whole, and the trees will grow finely, and the grass will grow luxuriantly, and the house will grow beautiful, the children will grow contented, the fathers and mothers as they grow old will grow happy, the neighbors will grow to emulate and to excel, the township will grow attractive, and the young men and the young women will grow up to think and to feel, that there is no place after all like home, "Sweet Home."

MORTAR AND CEMENT, AND THEIR USE IN THE CONSTRUCTION OF WALLS.

BY THE HON. GEORGE GEDDES.

From the New York Weekly Tribune of July 7, 1869.

All farmers are to some extent builders, and thus have occasion to use mortar, and so have the best of reasons for desiring to know all that they can as to the proper materials, and the best methods of making and using it.

It is not practicable to lay down in any form of words such instructions as shall remove every difficulty, and enable all men to become masters in the art of compounding the necessary materials for first-rate mortar, but it is thought to be entirely possible so to present the important points involved, as to aid most farmers in this important matter. It might be supposed that masons should possess all the knowledge necessary in regard to mortar, as they spend their lives in using it; but in fact this is not so. In great cities skilled masons may yet be found, and occasionally one may yet handle the trowel in the rural districts. The greater part of mechanics away from large towns have been led to the adoption of the branches they follow, more by natural taste and personal ingenuity, than from a settled purpose of early life, that has carried them through any regular apprenticeship. The schools have been busy teaching what have been called higher branches, rather than the principles involved in mechanic arts, and it has thus been, as a general rule, beyond the reach of the self-taught mason to acquire a knowledge of the leading principles involved in the making of the best mortars from the materials within his reach; and, too, the ever varying character of these materials has made the study of this matter one of real and great difficulty.

It is but just to our masons to say, that in England, where much greater care is taken in the instruction of mechanics as apprentices, the same fault is found with mortar that there is in this country, though, as a matter of fact, the mortar made there is doubtless much superior to ours.

MORTAR IS ARTIFICIAL STONE

The object aimed at in making mortar is to produce a substance in a plastic form that can be moulded into any desired shape, and then turn to stone. When mortar is to be used for cementing stones or bricks to each other, it should possess the property not only of attaching itself firmly to the stones or bricks, but it should have cohesive power that will hold its own parts in contact—in fact, it should be an artificial stone filling all the space between the parts of the wall, and as strong as natural stone. Whatever of this hardness and strength mortar lacks, after a sufficient lapse of time to allow the process of crystallization to become complete, by just so much does it come short of perfection.

Much has been said of the superiority of Roman cement over that produced by the moderns; and the art of making it as it has been called, is supposed by many writers to have been lost. But this is not so. Pliny and Vitruvius have left in their works sufficiently specific directions to enable the moderns to make a cement equal to that used in the days of these writers. Knowledge of materials is necessary—and this is given by these writers—and then of the necessary manipulations, and lastly the disposition to expend the necessary labor.

MATERIALS—LIME.

Carbonate of lime consists of 57 parts of lime and 43 of carbonic acid; a little water is usually present. (*Analysis of Vauquelin.*) According to Sganzin, it is composed of lime, 64 parts; carbonic acid, 33; and water, 3. But lime is not often found in this condition of purity. "The carbonates are frequently mixed with alumine, magnesia, silex, and the oxides of iron and manganese; and also with sulphate of lime. When it does not effervesce copiously with acids, and is hard enough to scratch glass, it contains silicious or aluminous earth. When of a deep brown or red colour, it contains oxide of iron. When it effervesces slowly, producing a milky appearance, it contains magnesia; and when black and fetid, it contains a coaly substance." By calcination, which may be done in an open or closed furnace or kiln, the water and carbonic acid are driven off, leaving what is called "quicklime," which strongly attracts moisture from the air, and by the addition of water slakes and increases greatly in bulk. The purest samples will produce, by measure, five parts of slaked lime from two of quicklime. The impurer limes increase less in proportion to the quantity of foreign substances combined with the carbonate of lime. Where the proportion of foreign substances becomes very great, the burnt lime will not slake at all, and it becomes necessary to grind it to powder in mills. This is the case with what is known as "hydraulic" lime.

Previous to burning or calcination, it is not always easy, by observing the external characteristics, to distinguish the simple or pure limestones from those that have clay and iron mixed with the lime; but, whatever may be the colour in an unburned state, the pure lime, when burned, is white, while the impure lime will have, after burning, more or less of a light ochrey tinge. "*The brown lime is by far the best for all kinds of cements;* but the white varieties, being more abundant, and allowing of a larger proportion of sand, are generally made use of." (*Rees' Cyclopedia, Article on Cements.*)

HYDRAULIC LIME

is simply an impure lime, having silex, alumina, manganese, and oxide of iron in combination, and in sufficient quantity to prevent slaking. This stone is burned like other lime, and then ground fine. It should be used while fresh.

Hydraulic limestone is found in various countries, but where it cannot be readily obtained, it has been imitated by "slaking common lime under cover and mixing it with grey or brown clay, by means of a little water. It is then made into balls, which are then dried and baked. Being master of the proportions of this mixture, we can give to this fictitious lime any degree of energy required, and thus we can equal, and even surpass, the best natural hydraulic lime. The common lime will bear even 20 per cent. of argile (clay). For the medium lime, that is, that which is a mean between the common and hydraulic lime, will take from 5 to 15 per cent. of argile. When we augment the quantity to 40 parts of clay to 100 of lime, *the lime does not slake;* the mixture can be pulverized, and when moistened, it becomes solid immediately, when immersed in water." (*Sganzin.*)

From the description that has now been given of lime, which is the leading constituent of all mortars, it is plain that very considerable scientific or practical knowledge is necessary to decide as to the fitness of any variety of limestone for the particular use required of it.

The absence of either the scientific or practical knowledge can only be compensated by actual experiments made expressly to test the quality of material, and to determine what substances, and in what proportions to mix with it, to make a good mortar. It was by long practice and much observation that the Romans came by their knowledge.

SAND.

The next in importance to lime, stands sand, as the leading constituent of mortar. Sand is usually divided into classes known as "pit" and "river;" and it is again divided into "coarse" and "fine." There is a prevailing opinion in favor of river sand as best for making mortar, but both ancient practice and modern trials have established the general superiority of pit sand over that found on the shores and bottoms of rivers and lakes. The particles of which common sand is composed vary very much in their mineral constituents; sometimes the mass is nearly pure silex. In other localities the particles are calcareous, and again they are argillaceous, and sometimes metallic. Rondelet made experiments in regard to sand, and came to the conclusion that sand immediately from the pit made better mortar than sand made from pounded sandstone, and he gives the preference to coarse over fine sand. His translator says, that "for common mortar coarse sand stands first; mixed, coarse and fine, second; and third, fine sand. For hydraulic mortar a mixture of coarse and fine sand is best; next, fine sand; and lastly, coarse." "The workmen at Paris use pit sand for masonry, and river sand for plastering stuff." (*Sganzin.*)

PUZZOLANA.

The Roman cement had, in addition to lime and sand, a substance called "puzzolana," which is a volcanic production found in great quantities in Italy. It consists of from 55 to 60 per cent. silex, 19 to 20 of argil-

laceous earth, 5 or 6 of calcareous earth, and from 15 to 20 of iron. This substance, "baked and calcined by the force of volcanic fire, when mixed with common mortar, not only enables it to acquire a remarkable hardness in the air, but to become as firm as stone, even under water. The only preparation which puzzolana undergoes is that of pounding and sifting, by which it is reduced to a coarse powder. In this state, being thoroughly beaten up with lime, either with or without sand, it forms a mass of remarkably tenacity, which sets speedily under water, and becomes at least as strong as good freestone." The cement used by Mr. Smeaton, in the construction of the Eddystone Lighthouse, was composed of equal parts of lime and puzzolana.

In Europe other substances, such as trass, which is of volcanic origin, and coal and wood ashes are mixed with common lime and sand to make good mortar. The object aimed at in each case, is to add some substance to pure lime and pure silicious sand that will cause them to crystallize into a solid stone. A large proportion of the limestones of this country contain in combination the necessary clay, iron, magnesia, etc., to secure in part at least this object. Where the lime is not of this character, I have known loamy sand used to give what the mason called "toughness" to the mortar to be used for plastering. In laying stone or brick work, the addition of a proper proportion of hydraulic lime secures the crystallization.

PROPORTIONS OF THE MATERIALS.

The quantities of the substances used in forming a mortar can be given only in general terms, for they must vary according to their quality. Perhaps the best general rule that can be laid down is: put all the lime in the sand that can be, and not add to the bulk of the sand. If sand, the particles of which are of unequal dimensions (some fine and some coarse), have well slaked lime of proper quality added to it, *and the whole mass be thoroughly mixed and worked*, the lime should exactly fill every interstice so as to form a solid mass, and this being so, crystallization will be perfect. *Air slaked lime should never be used in constructing permanent walls.* In cases where it is important that the mortar should set rapidly, more lime will be necessary. In using hydraulic cement, sometimes the quantity of lime is much increased beyond the point necessary to fill all the interstices of the sand, to secure quick setting, but the cement never becomes as strong as when the lime bears the proportion to the sand that has been stated. Some trials carefully made with Onondaga hydraulic lime, that have come to my knowledge, go to show that four to five bushels of sand to one of lime made the best cement, *but the mixing was very thoroughly done before any water was put to the lime and sand.*

In mortar made of quick-lime for brick work by machinery, it has been found that one bushel of unslaked lime that did not quite double its bulk by slaking, made a sufficient quantity to fill all the interstices of five bushels of fine sand—and this was abundantly rich in lime. But it must be remembered that this mortar was made by machinery, and the power was not spared in mixing. Mixed coarse and fine sand requires less lime than fine sand.

The superiority of ancient mortar consisted, as I have tried to show, first in the selection of materials; but it consisted, secondly, in the great amount of labour that was given to the mixing and working the mortar. Very little water was used, but an immense amount of labour. Felibien says: "It is a maxim among old masons to their labourers that they should dilute with the sweat of their brow, *i. e.*, labour it a long time instead of drowning it with water to have done the sooner."

The whole secret of what has been considered the lost art of making the Roman cement lay in the skill in selecting and in the manipulation of the materials. The climate of Italy is mild, and time has completed the work.

The cost of labour in this country is too great for us to expect good mortar to be made by hand.

Machines have long been in use, but I cannot learn of any very perfect one for mixing mortar, unless one of recent invention shall prove so. Steam power, except where the cheaper water power can be had, is alone adequate to perform the service required, at a reasonable cost. In dense populations, I can see no good reason why steam-made mortar should not supersede hand-made.

APPLICATION OF THE FOREGOING CONSIDERATIONS.

Mortar for outside walls that are exposed to the weather should have some hydraulic lime in it. All foundations that take moisture from the earth should be made of hydraulic lime. It will take more hydraulic lime to make a given quantity of mortar than it will of quick lime, and generally it will cost more, but if the structure is a valuable one, the increased cost will be justifiable. I have used equal parts of quick and hydraulic lime in stone walls, and was well satisfied with the cement. Above the water tables of stone buildings this mixture of the two kinds of lime does very well.

In laying either stone or brick, it is important to use strong pressure to compact the mortar in the joints. The mason does this on stone by the free use of his hammer, and on brick by striking each brick as it is laid, smartly with the handle of his trowel. This is important, and in pointing, the mortar should be well pressed into the joints and thoroughly compacted.

I once laid a cellar bottom with hydraulic concrete—gravel, sand and lime—and found after several days that it was yet soft on top. A plank was then laid on the surface, on one side of the cellar, and a man with a heavy mall pounded the plank for its whole length, then turned it over, moving just its width, and again pounded it. This was done over all the cellar bottom, and by the compression and consolidation of the concrete so produced, the whole mass at once "set," and became hard as limestone.

I lately witnessed the making of sewer tile of large calibre. The sand was some of it in grains of the finest kind, and from that up to fine gravel. Two parts, by measure, of sand, to one part of hydraulic lime, were thoroughly mixed before wetting—then a little water was added, just enough to moisten the mass, so little that when grasped in the hand no water could be forced out of it, and when the hand was opened it fell apart. The mass was again thoroughly mixed with the shovel, so that every part was equally moistened. Then it was put into the moulds, which were of iron, the core about an inch and a half from the surrounding shell. In this space the cement was cast, a little at a time, by shovels. The sections were about three feet long, and moulds stood upright so that the section would stand on one of its ends when finished. As the cement was flung into the mould, a man tamped with an iron bar

that nearly fitted the whole space for the width of the bar. He drove the material solidly together with this tamping iron, using repeated and hard blows. Thus was the mass consolidated, and the particles of lime and sand driven into close contact with each other, and the little water used proved abundant to make the whole moist enough to secure crystallization. The tile thus made are as hard as stone in a few months, and they stand the freezing and thawing of our severe winters, in the most exposed situations, far better than any masonry held together by mortar, that has come under my notice. It appears to me that in their manufacture the true principles involved have been perfectly regarded, and I give the process as an example of what may be done where labour is not spared.

BRICK WORK

requires finer sand than common stone masonry. The ordinary lime should have added to it, for all walls exposed to driving storms, some finely ground hydraulic lime, and the brick should be wet before laying. This is a very important point, and generally much neglected. The masons are unwilling to handle wet brick, and the trouble of thoroughly wetting is considerable. If the brick are *soaked* in water until they have taken all they will hold, and then allowed to so far dry as to leave no water on their surfaces, the mason's objections will be removed, and only the cost of the wetting will remain, and this will be abundantly repaid. A dry brick at once absorbs the water from the mortar, and *evaporation*, not *crystallization*, is the result, and the lime and sand are left a dry mass, that crumbles at a touch. If the brick are so moist that they take no water from the mortar more than a stone would by absorption, the mortar has time given it to go through with the process of crystallization, which is a very slow one, unless the lime is nearly hydraulic in its composition, and even in that case, though the first part of the process is comparatively rapid, it is not completed for a long time. Most writers on this subject say that mortar improves in strength for a very great period of time.

HYDRAULIC LIME

of the best quality is alone suitable for walls that are to resist the direct action of water.

Remembering that all mortar made of lime and sand shrinks in setting, it follows that large stone bedded in even the best hydraulic mortar cannot be depended upon for a wall that will be secure against water leaking through it. Plastering on the side next the water is therefore necessary in the construction of cisterns, and this is not always a perfect protection. After the plastering is dry, make a wash of hydraulic lime, and go over the plastering several times with this wash, using a brush as in whitewashing. This will close up the fine cracks or checks, if there are any, and the wall will then be perfectly tight.

CONDUITS for bringing water from springs are extensively used, made of about one part of hydraulic lime to two (sometimes three) parts of sand, mixed coarse and fine. When such a pipe is well made, I know of no better for carrying water under small heads. It is of little cost, where hydraulic lime is to be had at a reasonable price, and once perfectly done, its durability will be perpetual.

CONCRETE buildings, made of gravel and cement, have been extensively constructed. In some cases they have given good satisfaction; in other cases they have proved disastrous failures. Lack of the necessary knowledge in selection of material, and lack of labour, may be assigned as the causes of these failures.

PROTECTION OF WALLS AGAINST CLAY BANKS.

All walls built against banks of clay or other tenacious earths, should have a dry wall not less than one foot thick between the cemented wall and the bank. This dry wall can be made of rubble and refuse stone, flung in without regard to careful placing, the object being merely to fill the space between the bank and the wall with some loose material that will allow all water that may fall on the surface, or may come in through the earth, to pass freely down to the foundation, where a drain should be laid to carry it off. This drain should in all cases be lower than the cellar bottom, and have a proper declivity and outlet. Unless the natural bank consists of loose material, such as coarse gravel, this dry wall is absolutely necessary to protect the cemented wall from the action of frost. Extra thickness of the cemented wall is not a sufficient means of guarding against the immeasurable power exerted by frost acting on earth saturated with water. I have seen a wall twenty feet high, against a bank of clay, flung down, though it was made four feet thick and laid in a hydraulic cement; and then a three feet wall put in its place, with the refuse stone and chips between it and the bank, carry off all water, and not only protect the wall against the action of frost, but prevent every particle of water from entering it.

In a pamphlet entitled *The Suez Canal*, by Charles H. Rockwell, I find a description of the construction of a harbor at Port Said, the Mediterranean terminus of the canal. As this harbor is made by the use of artificial stone, I think the account, given by Mr. Rockwell of the manner of making these immense blocks, worthy of laying before the readers of the *Tribune*:

"The material used in place of stone is a concrete formed of hydraulic lime from Theil, France, and the sand which is dredged out of the harbor. The proportions of the mixture are 825 kilogrammes of lime to one cubic meter of sand—say 715 pounds to 37 cubic feet. (Probably, by measure, about 2¼ to 1.) The concrete is formed into large blocks, which measure 11 feet 8 inches in length, 6 feet 7 inches in width by 5 feet in depth, looking like immense bricks, containing 370 cubic feet each (10 cubic meters), and weighing 22 tons. As we saw them manufactured, the lime and sand were ground together in large circular cast-iron troughs, about twelve feet in diameter; in each trough there ran three heavy iron wheels, which completely pulverized the lime, and thoroughly mixed the ingredients. The grinding was continued for about 20 minutes, a small quantity of sea-water being added from time to time, until the mass had assumed the consistency of thick mortar. A trap-door in the bottom of the trough was then opened, and the mortar fell into a car standing below. A line of rails guided the car to where the moulds were set up, and into these the mortar is dumped and carefully rammed into the corners. In about a week's time the concrete has so 'set' or dried, as to retain its shape after the planks and clamps which form the mould are removed; these are then set up again in another part of the yard. After drying in the open air for about three months, these blocks become hard enough to bear handling without danger of being broken.

"They are then raised by a steam crane and placed on a car on which they are conveyed to the dock. Here another crane lifts them from the car and places them

on the deck of a barge fitted to receive three blocks at a time; they rest upon a platform which has an inclination of 20°, and are retained in their position by 'fingers' attached to an iron bar which runs across the lower ends of the three masses.

"The barge is then towed to the proper position in the line of the proposed pier, as marked by signal-flags, on shore and by buoys. When in line, the 'fingers' are made to release their hold upon the blocks, and they slide off the barge into the water. After having been submerged for a few months, the concrete becomes nearly as hard as granite. When the accumulation of blocks has approached so near to the surface of the water as to prevent the passage of the barge across the line of the pier, the blocks are lifted from the barge by a floating crane, and deposited in their destined positions one above another, until the top of the pier is about 15 feet above the surface. There are about 80 of these blocks made per day, and the same number daily submerged. The price paid to the contractor is 400 francs each. There will be required about 30,000 of them, making the cost of the two piers 12,000,000 francs."

The barbor is now finished and in use, having water 30 feet deep, and appears to be a success; and certainly the manner of its construction was in fit keeping with the rest of this gigantic enterprise, which only finds its parallel, in this wonderful age, in the Pacific railroad.

INDIGESTION IN HORSES.

(North British Agriculturist, July 27.)

At the Liverpool Veterinary Medical Association, Mr. Joseph Leather, read the subjoined paper on indigestion in the horse. It is so plain and practical that no introductory comments regarding it are necessary. We may, however, remark that the summer and autumn months usually furnish a large crop of serious cases of indigestion amongst farm and other heavy draught horses, owing to their eating freely dry hard fibrous clover and vetches, which resist the triturating solvent influences of the teeth, stomach, and bowels. Such refractory indigestible food accumulates in the bowels, particularly in the capacious colon, and causes a chronic form of indigestion, which unless early relieved, leads to dulness, nervous prostration, coma, and death. The present scarcity of water throughout many parts of England and the Continent greatly increases the liability to this and other forms of indigestion. At this season of the year, when the weather and food are both so dry, when the abundant perspiration rains so freely from every hard working beast, and indicates that the animal fluids should be again rapidly replenished, plentiful supplies of good water should be ensured for all horses. Such a provision not only helps to ward off attacks of indigestion, but by keeping the animal comfortable and in good heart, will further enable him to perform his duties with greater ease and success.

"The horse," Mr. Leather truly remarks, "is not subject to anything like the variety of gastric derangements that man is; although living in an artificial state, and on food in a great measure artificially prepared for his use, he is not allowed, like man, to overgorge the stomach, and derange its functions by the excessive use of brandy and water, cigars, &c., but, as a rule, has his food and water carefully dealt out to him in such quantity and quality as will generally insure him against dyspeptic attacks. Nevertheless, circumstances do occur, and those by no means rare, when the necessary attention is not paid to his diet, and serious derangement of his digestive apparatus is the immediate consequence.

"In order that digestion may be perfect and easy, it is requisite that the food should be in a state of minute division. A weak stomach acts slowly or not at all, on tough masses of solid food, and horses, like men, have weak and dyspeptic stomachs. The greedy feeder swallows a great part of his food half masticated; the cribber frequently distends his stomach and bowels with gas. In the former, the delayed masses undergo spontaneous changes, which are promoted by the mere warmth and moisture of the stomach, gases are extricated, acids are formed, and the half-digested mass passes undissolved into the duodenum, and becomes a source of irritation during the whole of its journey through the intestines. In the latter, he distends his stomach and bowels so frequently with air, as to weaken the whole of the digestive powers, and to render him a dyspeptic subject. His rough coat, tight skin, and emaciated frame, prove incontestibly that his food passes through the alimentary canal without undergoing due conversion, or without his deriving that benefit from it which the healthy animal does.

"I will endeavour to consider this subject under two heads, namely, the mild form unattended by acute pain, called chronic; the other, which takes place suddenly, the symptoms of which are altogether more violent, and which is perilous to the existence of the animal, called acute. In a state of chronic indigestion, the horse does not thrive as others do, nor is he capable of doing the same amount of work; his appetite is fastidious—good, and even voracious at one time, and only indifferent at another; it is sometimes depraved; he is fond of gnawing his rack and manger, is frequently found licking the walls, and even eating the plaster from them; I have even seen instances where they have actually nibbled at their own excrement. The skin, from sympathy with the alimentary canal, has an unhealthy appearance; the coat stares, and the animal becomes more or less hidebound. The dung has not its natural appearance; at one time it is dark, and at another light coloured, and has a very offensive smell; it is usually voided in small, hard, glazed balls, and if examined will be found to consist of chopped hay and imperfectly changed oats. In the stable this is the usual state of the fæces, but in his weak state the horse is easily excited when at work, and purging is the consequence. The urine is scanty and high coloured.

"The ordinary seat, particularly of chronic indigestion, is the mucous membrane of the stomach and the intestines, and the disease may be defined to consist of a congested state of the blood vessels of that membrane; there is, consequently, a want of the proper secretions, and constipation is the result. This torpid or abnormal state may be produced by many causes, such as irregularity in the quantity and quality of food, imperfect mastication of food in consequence of diseased teeth, or from greedy or ravenous feeding, long fasting from food and water, cribbing and quidding, from irregularity in the teeth, or bots, previous attacks of acute indigestion, or irregular exercise, disease of the liver, &c., &c—these are among the principal causes of indigestion in the horse.

"There are few animals in their natural state that are supposed to spend more of their time in feeding than he does; and the fact that he has no biliary receptacle proves the necessity of his doing so, and ought

to be a lesson to all those who are interested in his well-being to copy the dictates of nature by feeding him frequently. A long fast renders a horse voracious, like the naturally greedy feeder; his food is bolted without sustaining that thorough grinding with the teeth so essential to healthy digestion. If allowed, he will sometimes overgorge himself with an indigestible mass to such an extent as to bring about the partial or entire suspension of the movement and secreting power of the stomach, and thus put his life in serious danger from fermentation and rupture. Wheat or green food is most likely to produce this effect; and especially so if he be put to severe work immediately or very soon after feeding. New oats or new hay will also produce it; also debility of the digestive organs, or an unhealthy state of the general system, or it may be caused by excessive fatigue, producing general weakness; cold water given in too great abundance immediately after feeding, by washing the ingesta from the stomach before it has properly chymified, will cause it; allowing the body to cool too quickly when warm; bad treatment, and so will irregularity of work, or nervous excitement of any kind.

"The symptoms of the acute form of this disease will depend altogether upon its particular seat. If the horse has overloaded his stomach he will have excessive nausea, expressed by the drooping head, turning up the nose, attempts to vomit, eructation, a slow, weak pulse, and great prostration and heaviness, distension of the abdomen, and colick pains; there may or may not be sympathetic affections of the brain, producing stupor and staggers. There are many cases where this symptom is not present, though the stomach is distended to the utmost; the horse is frequently attacked in the midst of his work, becomes uneasy, and will be down, and at times at full length for a considerable period, the extremities are cold, the visible mucous membranes are not much injected, the bowels are constipated, the mouth dry and clammy, and the horse has a peculiar haggard countenance, which becomes more and more ghastly as the disease advances; should the stomach burst he becomes pulseless, cold sweats break over him, the membranes are pale as in death, he makes frequent attempts to urinate, and to force anything from the rectum, he reels, staggors, and very soon falls headlong into a corner and dies.

"Although cases of acute indigestion, such as I have just described, where the disease is altogether confined to the stomach, are by no means rare, still the true seat of the great bulk of our acute cases will be found in the cæcum and colon, that mighty receptacle, which might indeed be called the horse's second stomach, for it is indisputable that large masses of nearly indigestible matter lodge there, no doubt for the wise purpose of extracting from it the last particles of its nutritive properties, and it is natural to expect that where there is the greatest accumulation of aliment, there should be the most frequent derangement of function, and so we find it, for in large practice the treatment of this form of indigestion becomes almost a daily occurrence. The large masses so frequently accumulated in this part of the bowels, in the heavier class of animals particularly, becomes a frequent source of irritation, producing acute enteritis, but far more frequently that form of indigestion, so well known to every amateur in veterinary science, under the designation of flatulent colic. The causes of this form of indigestion are nearly the same as those which produce it in the stomach, and which I have enumerated before, but the most common are, eating green food to satiety; if wet the danger is greater, and if wet with white frost, most dangerous of all, all kinds of new corn, from their greater tendency to fermentation, or new hay, or large masses of indigestible matter of any kind, which has been imperfectly chymified, from a defective state of the stomach. If the horse be attacked in the stable, he ceases to eat, and seems to feel a disgust for all species of food and drink, the head is lowered and occasionally thrown from side to side; if he is at work he becomes suddenly heavy and idle, or works with more precipitation than usual, he stops, scrapes with his fore feet, and makes some contortions, and strives to lie down, consents to continue his journey only when excited by the voice and whip of his driver; he does not go far before he stops again, looks at his belly and groans, strikes at it with his hind feet, lowers the head and neck, and makes another effort to lie down, in spite of whip or voice.

"His driver, however, will now find it necessary to get him into the stable, or the establishment of a veterinary surgeon, with as little delay as possible; very soon the disease becomes aggravated, the paroxysms of pain become more frequent and violent, the horse is out of breath, and covered with sweat, he lies down and rolls from side to side, the pulse as yet not much disturbed, except during the paroxysms, the belly is swollen, the nostrils are distended and the whole frame seems to quiver with agitation; later on he sustains himself with more difficulty, spreads his legs to support himself upright, and will often be found to lean against the wall for support. He now lies down with more caution, he dreads the danger in doing so, he often stretches himself, and makes vain efforts to dung and to urinate, feels a desire to vomit, manifested by the elongation of the head and neck, he frequently belches up gas, which is sometimes accompanied with liquids, mixed with particles of food, which escape by the nose and mouth. The swelling of the belly now augments with fearful rapidity, the right flank becomes elevated, the countenance expressive of the most intense suffering, the pulse is nearly imperceptible, he is now nearly insensible to everything that is round him, and to everything that you do to him, except, perhaps, that he will refuse to take any draught with all the energy with which he is still capable. The anus, forced out by the intestines, forms a sort of soft tumour which elevates the tail. The skin is now covered with a cold sweat, and the pulse completely gone; the air can scarcely penetrate the respiratory organs, the blood circulates with difficulty in the vessels, asphyxia becomes imminent, the animal staggers, and may fall heavily; sometimes he is relieved by sitting on his quarters like a dog, but this relief is deceptive, it is the result of rupture of the stomach, intestines, or diaphragm, allowing displacement of gas. A moment after he becomes comatose, there is no further relief for him, his vital energy is exhausted, and he dies.

"I now come to the treatment of the various forms of digestive derangements, which I have endeavoured to describe in this paper; and in doing so, it will be necessary that we consider carefully the causes by which they are produced. In all cases, but particularly in those of the milder form of indigestion, much may be learned from the groom, or stable attendant, and it is of the utmost importance to the success of our treatment, that as much of the history of the case be got from him as possible.

"If the horse has been irregularly fed, or his work

more than ordinarily severe, he should have absolute rest, change of diet, a slight dose of physic, and a few vegetable tonics; if the cause is greedy feeding, have his corn ground, hay chopped, and a muzzle put on at night, to prevent him filling his belly with indigestible matter; if he is a cribber, let him wear a strap round his neck, or have the manger removed and feed from the ground; if from irregularity of the teeth the diseased ones should be removed, or the protruding part cut off, or rasped down; if produced by bots, or other parasites, prescribe for their removal, and the disease will subside. Indeed, many of the milder cases of indigestion may be cured by rest, change of diet, and stable management; the body and legs should be kept warm with clothing and bandages, the stall or box well littered and kept clean, the food given often and in small quantities, in summer green food, or a run at grass, and in winter carrots and bran mashes, mixed with small quantities of barley or malt well boiled, occasional small doses of physic, say 2½ drams, to 3 drams, of aloes with half a dram. of calomel, and this to be followed with vegetable tonics, will often be of the greatest service. If the animal bites the walls and eats the plaster, heartburn is present; discontinue his oats and beans for a few days, substitute boiled barley and bran, give the medicine above prescribed, and add to your tonic mass 4 drachms of carb. soda, or prepared chalk daily. Severe purging does harm, but mild laxatives with good nursing, change of diet given in small quantities, with moderate slow exercise, will often be all that is necessary. If the case be an acute one, and the stomach overloaded, it becomes a very serious matter, and it will depend in a great measure, on the extent to which that organ is packed, whether any treatment be of the slightest use.

"I have examined horses that have died from rupture of the stomach, and found upwards of forty pounds of food in that organ. The ingesta were nearly dry, and had no appearance of having been acted upon in the slightest degree by the gastric juice; that secretion must have been entirely suspended, as well as the movement of the stomach, by the excessive weight of its contents. Medical treatment in cases of this sort must, I fear, ever prove futile in the horse, but fortunately they are not all so bad, and plenty of cases will be met with where the stomach is overloaded, but only to such an extent that active treatment is often efficacious. In such cases the object to be aimed at is the expulsion of the contents of the stomach, and the most natural way is to rouse that organ to increased action, and to accomplish that I know of nothing better than stimulants and purgatives. Apply mustard, sweating liniment, or cloths wrung out of hot water, throw up injections, and order the animal as much gruel as he will take.

"While the walls of the stomach are so distended, there is no danger of inflammation; should there be any cerebral symptoms, such as heaviness of the head, leaning the head on the manger, or thrusting it against the wall, to the other treatment a good free bleeding should be added. If the disease takes its tympanitic, or gaseous form, the cæcum or colon is its usual seat; the cures for it are innumerable, every quack has his own infallible specific, and most veterinarians have a remedy, which they think nearly a certain cure; but although many cases, no doubt, are cured, still it is beyond doubt many die, and from gaseous distension alone, without a particle of inflammation.

"Like the previous case I have dealt with, where the stomach is distended with food, expulsion is the object we have to attain. To have the bowels distended with gas, we must have fermentation, and to have fermentation, there must be a mass of imperfectly digested matter in the gut. All agree in giving the most powerful stimulants and there are few who don't think it necessary to combine them with some active cathartic—of course the dose of cathartic medicine must be regulated according to the size and strength of the animal—from four to eight drachms of aloes, the horse may be walked about a little, but avoid forcing him to trot, and don't continue in the walking very long. If the case has been a serious one care should be taken not to allow the horse to work too soon, and his diet should be simply slop. In despite of all treatment, however sound both in theory and practice, our case will sometimes go on until the poor animal seems on the point of bursting.

"I have heard of some veterinarians using the trochar, or puncturing the cæcum, but never having tried it myself I cannot speak of the desirability of such an operation."

THE METRIC SYSTEM.

BY PROFESSOR W. D. WILSON, LL. D.

From the Cornell Era of December 9, 1870.

Professor Davies has just published a volume on this subject, which is likely to attract attention to the need of some amendment of the system or rather systems of weights and measures in the various nations of the civilized world. The volume has been published by A. S. Barnes & Company, New York, and consists of: (1) a statement of the system; (2) Professor Davies' report on the system, made to the University Convocation last August; (3) a report made by Hon. John Quincy Adams in 1821, when Secretary of State; and (4) the lecture of Sir John Herschel on the same subject. We have here about all that can be said on a very important subject.

It is of course advisable to have a system of weights and measures for all things, which shall be the same in all nations and through all ages. In order to do this there must be some common standard, accessible to all, indestructible and capable of reproduction in case of loss by any of the accidents to which all human things are liable.

The French system is based on the measurement of an arc of the meridian passing through Dunkirk and Barcelona, one ten millionth part being taken as the unit, which is called the *metre*, and is about 39.37 inches. And from this the unit of other measures is obtained.

Another feature of the French system is the decimal gradation of all the denominations, as in our federal currency, mills, cents, dimes, etc.

And finally it is proposed to make a new set of names derived from Greek roots, thus: millimetre, centimetre, decimetre, *metre*, decametre, hectometre, kilometre, myriometre.

"From this primitive base, or standard, every weight and measure is derived by the application of the decimal scale of tens.

"The larger or multiple units of the base are designated by prefixing to the base the Greek numerals; and the smaller units, or sub-multiples, by prefixing to the base the Latin numerals.

"In space there are four kinds of quantity to be measured, viz: 1st, Distances; 2d, Surfaces; 3d Volumes; and 4th, Angles; hence there must be four units of measure.

"I. DISTANCE.—For this the unit is the metre, which is increased and diminished according to the scale of tens.

"II. SURFACE.—For small surfaces the square metre and the squares constructed on its decimal divisions are used. For the area of land the base unit is the square constructed on the deca-metre, called an *Are;* hence an *are* contains 100 square metres, each of which is called a centi-are. In this measure there are three units, viz:

"Centi-are = 1 square metre = 1.195985 square yards;
Are = 119.6 sq. yards = 4 perches, nearly;
Hectare = = 2.471 acres.

"III. CUBIC MEASURE, or Measure of Volume:

"1. The cubic metre, which is used for the measurement of excavations and embankments. It is equal to 35.816 cubic feet.

"2. The cubic metre is also used for the measurement of wood, and is then called a stere, which has one sub-multiple called a deci-stere, and one multiple called a deca-stere. Hence, for wood measure there are three units—deci-stere, stere and deca-stere. The base unit, the stere, slightly exceeds a quarter of a cord.

"3. The litre is used for the measurement of all liquids and dry articles. It is the cube constructed on the deci-metre as an edge, and hence is one-thousandth past of the cubic metre, equal to one wine quart, very nearly.

"FOR ANGLES.—Although the metre is derived from the arc of a meridian, it is a singular fact that neither it nor any multiple or sub-multiple of it is used in the measurement of circles or angles. In this department of measurement alone the old unit and its subdivisions are preserved.

"WEIGHT.—The unit of weight is the weight of a cube of water constructed on the centimetre as an edge, and is called a *gramme.* It is equal to about 15.32 grains Troy. The kilogramme, equal to 1000 grains, equal to 2¼ lbs., is the unit for larger weights."

The English have provided that the pendulum that will vibrate in seconds, *at London*. shall be the standard for their measures. This is nearly as long as the French metre. But they do not propose to change the names already in use, nor to adopt the decimal system.

Each of the three treatises contained in the book above mentioned is unfavorable to the French system, and probably the whole book taken together contains as full a discussion of the subject as can anywhere be found.

The objections to the French system are three-fold.

1. There seems to be a doubt whether after all the *decimal* system is best on the whole. Any reader will be surprised to find so many reasons for another and a different one.

2. The French unit is after all rather theoretical than practical. There is no certainty, nor on the whole a probabilty that the arc of any meridian or other curve on the earth's surface is constant. And even if it were so, no two measurements of it would *exactly* agree. But above all, and if these difficulties were removed, there is no way of picking up such a line and doubling it time after time until we get a fractional part of it that is short enough to serve as a unit of measure. If we had a string which we were desirous of using for that purpose, we could double and thus get any part of it without the intervention of any other means of measure. But in the case of the meridian—why, it is so many units, so many yards, so many feet or inches, and in order to get the 10,000,000th part we must use some measuring rod already in use, and then this rod and not the meridian becomes the standard.

3. But finally, the French nomenclature is impracticable. We have given specimens above. We take another from Professor Davies' report—a paper, by the way, fully equal to that of J. Q. Adams or Sir John Herschel: "The distance from Albany to New York, instead of 145 miles, is 229,680 metres. A lot of ground 25 by 100 feet would be 7 metres, 6 decimetres, 2 centimetres by 30 metres, 4 decimetres and 8 centimetres."

We have not time, in this fast age, for such long designations of small things. And we agree with all the three who have written on this subject that not all the advantages of the decimal system, even if they were a thousand fold what they are, could ever prevail to bring so cumbrous and inconvenient a nomenclature into general use.

However, we cannot doubt that some changes will be made in existing systems, and uniformity in some of these be gradually approached. The report of Professor Davies suggests two: (1) that the unit of money be so changed that the American dollar and the French five-franc piece be made equal, and that the English pound be made to equal five of them. (2) He also proposes that the ounce avoirdupois and the ounce Troy, which are now nearly equal, be made exactly so, and the three systems—Apothecaries', Troy and Avoirdupois—be combined into one on this basis, and all unnecessary designations be abolished.

The committee have embodied the substance of their report in a series of resolutions, which they submit as follows:

1. *Resolved,* That the subject of changing our entire system of weights and measures, and substituting therefor the metric system of France, is too grave and too important to be acted upon without a very full and careful examination of all its bearings and its consequences.

2. *Resolved,* That the committee on coinage, weights and measures be requested to publish their report to this convocation, with such additious as they may deem necessary, in connection with the report of John Quincy Adams on weights and measures, made to the House of Representatives in the year 1821, and the lecture of Sir John Herschel on the Yard, the Pendulum, and the Metre—to the end that the whole subject may be more fully discussed, considered and understood.

3. *Resolved,* That this convocation do recommend to all teachers and to all others interested in the establishment of uniform standards throughout the world, to give special attention and study to this subject, now engrossing public attention, that it may finally be disposed of wisely and for the common interest of all nations.

4. *Resolved,* That this convocation do hereby express its conviction that such changes should be made in the values of the franc, the dollar and the English pound sterling, that five francs be exactly equal in value to one dollar, and five dollars exactly equal in value to one pound sterling.

5. *Resolved,* That as a means of reaching uniformity of currency, it be and it is hereby earnestly recommended to all authors and publishers of elementary arithmetics to exclude from future editions every currency not recognized and established by law.

6. *Resolved,* That the committee on coins, weights and measures be, and they are hereby authorized to ask the attention of the government, and of all associations for the advancement of science and knowledge, to the expediency of changing the value of the ounce Troy, and thus substituting a single weight for the three now in use.

7. *Resolved,* That the committee on coins, weights and measures be, and they are hereby authorized to take such steps, by correspondence or otherwise, as will in their judgment be most likely to give effect to the above resolutions.

The above resolutions were adopted unanimously.

BEES AND BEE CULTURE.

From the Utica Morning Herald, April 14.

The following is the paper read before the Central New York Farmers' Club, at its last meeting, by Mr. M. Quinby:

While talking with an agricultural book publisher twenty years ago in regard to publishing a book on Bee Culture, he remarked: "You need not say anything of the natural history of bees. That has already been published time and again, and is well understood by everybody." And how was it understood—as it really was, or according to the traditions of forty generations; that the only perfect female in the hive was king, and governed as an absolute monarch; that if she died the whole colony became demented, did not know what to do or how to do it, refused to work, and died without a struggle, at once?

When we come to understand it better, we find a colony of bees, with a queen, one of the most beautiful examples of a pattern republic, equality, self-sacrifice, each laboring for the good of all, beyond anything in the human family. The majority rules. The queen, instead of possessing all the brains and thinking for the whole community, is simply the mother, performing more labor than any one hundred in the hive, and when lost she is regarded as mother rather than dictator, and when the hours of mourning are passed work is resumed as before.

It is only a few years since that Daniel S. Dickinson was heard to say that "the queen bee was all a myth. There was no such thing."

These things show *how* the natural history was understood. We find the practice of bee keepers corresponded admirably with their knowledge, few keeping them beyond a few years at once. I was told that I "must not always expect to have such luck; there would be a turn and they would dwindle away; it was always so." I cannot to this day see any reason why it should be so, but for our ignorance. Before we undertake the practical part, it is best to understand all that is possible of their natural history.

Who the first man was that subjugated the bee to his will, history does not inform us. Taking the improvements in their culture since the Christian era as a criterion to judge from, it must have taken man many thousand years to ascertain that the bee was of any use to him whatever. When dollars and cents cease to be the all-absorbing thought, and science has assumed its legitimate place in the mind of man, he may discover that still other animated creations may be turned to account. Man may yet utilize the hornet and wasp; may discover means to hybridize them, or change to a new race, superior to anything we yet have. But at present we have only to do with their nature as it is and what we can make of it.

Until about the present century, it is doubtful if any improvement was made in bee culture since the lion's carcase formed the hive. It is probable that the first colony of bees ever discovered was regarded very much as we regard the nest of hornets—of no account, or, if disturbed, somewhat objectionable to have around us. This idea seems to have been transmitted through all the generations to the present time, as there are occasional manifestations of fear yet to be seen. At some time it was found that what they had stored for their winter provisions was good to eat, for man as well as beast.

The natural habitation of the bee is a hollow tree in the woods. They are never found in the wilderness but a few miles in advance of the white man. The Indian terms it the white man's fly, as it accompanies him in his advance.

In spring and early summer the combs are filled with brood which hatches by thousands. Their numbers are soon doubled, and half or more leave the parent stock and found a new colony. They rush out, led or followed by their queen, and after flying a few moments, collect in a cluster on the branch of some tree. A few take hold of the branch, others cling to them. Such is the strength of their feet and legs that one will support twenty. The time that a cluster will remain will vary from half an hour to half a day, quite often it will hang over night. Instances are on record of their remaining clustered a whole week. A few of their number are sent out prospecting, to find a dwelling. They are now destitute of house and home, having deserted the old mansion. They have voluntarily left all those treasures that they have toiled so hard, so assiduously, to accumulate, to be enjoyed, not by the old folks, but by the young just now coming into existence. The old bees, with many others, and the mother, when the scouts have succeeded in finding a house to let, move in to commence housekeeping anew. The laborers bring in pollen, propolis and honey, secrete wax, construct combs, nurse the young, and defend their treasures from all pillagers. The next season their hive again becomes crowded with bees. All seem to understand the necessity of emigration, and unite in harmonious action to accomplish it. They do not move on the impulse of the moment, and rush blindly into an action that will work out their destruction. The bees want the mother to go with them. It is accomplished in the following manner, very much as if they knew of the antipathy always existing between queen bees of the same hive, although one may be the daughter. They construct queen cells, in size and shape different from any other, which are occupied with young queens. They are allowed to develop quietly till one or more is sealed over. The mother, the old queen, appears all at once to comprehend the critical state of affairs. Her instinct tells her that a queen, a rival, is within that cradle, that a few days more will develop into strength and activity which her own failing strength, heavy body and slow motions cannot expect to cope with in a final death struggle. Realizing the danger before her, a frenzied effort is often made to destroy her rival while yet helpless. She will tear in pieces the cell containing her royal offspring, pierce with fatal thrust the very heart of her innocent victim. The workers appear to expect this tragedy, and, with no apparent discouragement, build more cells, finish others, and repair the mutilated ones. This mother cannot longer consider it her happy home. She somehow communicates her willingness to leave. They issue, and cluster as before, probably to ascertain if the mother is with them. Another place is found. Life to that queen is once more commenced. But not a bee that was with her twelve months before is left now. All those have perished, and another generation has replaced them. After the swarm has left the old hive, the queen cells are watched with assiduous care. New cells are often made. Any eggs destined for workers can be converted into queens—an important fact to understand when we come to change our common bees to Italians. In seven or eight days after the swarm has left, the oldest queen in any of these cells matures and bites her way out. The very first action of her life, after leaving her cradle, is one of murderous intent. She seeks her innocent sister, still reposing in what would appear to be the impenetrable walls of her cell. Long before she has strength to fly she tears open the cell, exposes the most vulnerable part of her victim, and with one thrust of her poisoned dagger her rival is beyond the reach of help or interference. Another cell is sought, another victim is dispatched without trial or even accusation. No rest is allowed till the last one is sacrificed. It is not always thus. The community decides to interfere

with this slaughter. The bees have designs of their own, and when the people decide the government is democratic, even queens must obey. They wish to send out another colony, and want this queen to go with it. And when this enraged sister approaches a royal cell with destructive intentions, she is not allowed her will. The workers guard each one from any attack. Foiled in her attempt, and seeing the danger she is unable to avert, she traverses the combs uttering shrieks of agony or defiance, we cannot tell which, at intervals of a few minutes. They consist of a few piping notes, repeated a half dozen times. Other queens during this time mature, but are prevented from leaving the cells by the guard of workers securing the door. They hear the piping of their sister, and answer, while yet shut up, by repeating notes, coarse, short and loud, in proportion to their age. The first hatched queen, unable to endure the presence of a hated, imprisoned rival, and dreading a conflict which is sure to take place, in which her chance of success is only one in two, whenever that rival is at liberty, signifies her willingness to leave the scene of discord for a peaceful home of her own. After this swarm has left, or during its issue, another queen emerges from her cell. If the bees decide that another swarm shall leave, the same transaction as before takes place. When a third or fourth swarm issues, it is under like circumstances. When the last swarm has issued, the first queen that emerges destroys the remaining cells, as before described. If, during the excitement of swarming, two or more are liberated at one time, a deadly encounter follows, and the victor becomes the future mother of the hive. After all competitors are out of the way, contentment prevails. About the sixth day after her maturity, she leaves the hive to meet the drone. Sexual intercourse takes place high in the air. This is a critical time for any colony with a young queen, whether a new swarm or an old one. Notwithstanding the bees can rear queens when they have eggs or young larva destined for workers, they cannot do it now. The new swarm never had any eggs. In the old hive all that were left are too old to be changed. Now if this only queen that belongs to the colony should be devoured by a bird during her excursion, or through weakness or inability be unable to fly and fall to the ground, or on returning enter a neighboring hive, her colony, without help, is lost. The bees become alarmed by the next evening or morning, and understanding the consequences, manifest extreme despair, running about the hive in every direction, inside and out. It is not true that all labor now ceases. Work is resumed as usual, except at morning and evening of the next few days, and they become reconciled to their fate, and often fill their hives when they contain comb, another proof that the government is a republic and not a monarchy. An old stock filled while queenless will contain ten times the quantity of bee bread, or pollen, of one that has a queen and rears brood. This indicates that the bee-bread is consumed by the young bees.

The old stock that has swarmed, and loses its queen in July, will dwindle away and be gone by December, leaving the hive full of stores, empty combs, or worms. A new swarm that loses its queen will often last a little later, this depending on the number of bees at the time of loss. It is here we get a hint of the age of the bee, and the prodigious fertility of the mother queen. A barrel full of bees containing 100,000, without a queen, cannot be kept alive one year! The largest swarms are gone by winter. Three or four large swarms may be united into one colony, in June, and have a queen and raise the usual number, and yet there will be no more bees by January than an ordinary single swarm. A single colony rears as many bees as a double one. Two bees die in the double one while but one dies in the single one, and at this rate they are soon equalized. The age of bees is still further demonstrated by breeding the Italians. They are distinguished from the black or common bees by a yellow band around the abdomen. We wish to change a colony of blacks to Italians. We take away the black queen and introduce the Italian. She commences laying eggs next day, in three weeks they begin to hatch out, and are readily distinguished by the yellow band. The black bees die daily by hundreds and thousands! The Italians replace them at the same rate. In two or three months in summer all are changed. The age of the queen is often three or four years.

It is quite common for writers to speculate on what were the designs of the Creator in very many of his works. Perhaps I may be allowed to inquire what might be the end in view in creating the bee? It does not seem that the mere purpose alone of furnishing man with a little sweet, was sufficient. If that was all, it would seem it might have been accomplished more easily. The bee accomplishes a greater work, benefiting man, indirectly, in a multitude of ways unsuspected. Throughout the animal kingdom, all living beings are created male and female. This same principle is carried through the whole vegetable world. Through concerted action, species are propagated or continued. All animated nature possessing power of locomotion, is provided with means to effect this independently. But the vegetable world, tied to one locality, yet furnished with the fertilizing or male principle, even in greater abundance than animated beings, and very often situated at a distance from the proper receptacles, needs an agent to assist. Each staminate flower is provided with a superabundance of this fertilizing pollen, a portion of which must reach the pistil of the same, or some other flower, to produce fruit. As it is impossible to effect this without an agent of some sort, we cannot imagine one more simple, more convenient, than the bee, to carry it from one to the other. It seems to be just adapted to the purpose.

Flowers are perfect, containing both sexual organs—stamens and pistils—as found in the apple and most others. Imperfect, when the stamens are in one flower, and pistil in another of the same plant, as we find in corn, and most of our trailing vines, melons, etc. In another class of flowers, the sex is confined to plants, as hemp, hops, etc. Whenever these flowers are so situated that fertilization is not certain, the bee is appointed to effect it. Her tastes and instincts require honey for her food, and pollen to feed her young. The perfect flower, like the apple, furnishes both honey and pollen, but in small quantities. The manner of obtaining and packing this pollen is made to answer an important part in the economy of the arrangement. She alights on a flower containing both honey and pollen. To obtain the honey, she must crowd aside the stamens that sustain upon their points the trembling anthers, loaded with the farina, and in the agitation consequent on her manipulations, a shower of precious dust descends upon the pistil that is ripe for fertilization and covers the bee with imperceptible particles, each, when fully distributed capable of imparting or continuing life to a new being. To make fertilization doubly sure, it is required that she rises on the wing in order to appropriate a part of this pollen to her own use. The fine particles adhering to all parts of her body are to be brushed off and packed into little pellets upon her legs. The fanning of her wings during this process scatters another part of this dust, in ten thousand directions. Nothing like a load, even for a bee to carry, is obtained in one flower; she visits ten, twenty, perhaps a hundred, during one excursion, and the pollen that is obtained from the first may fertilize the last, rods away; and by this means prevent in-and-in breeding in the vegetable family. If there was patience to trace this throughout

all its ramifications, we should find the farmer greatly indebted to the agency of the bee for his full crops of fruit, and seeds of grain and grass. It is wisely and beautifully arranged. Yet some of our wise ones have complained, asserting, unadvisedly I think, that the honey that they take from flowers is a damage to them, seeing none of the great benefits to which I have alluded.

They have the power to secrete honey, the bee to collect it. She is warm-blooded, and that warmth is to be maintained by consuming her stores. Each tiny flower cup secretes a precious morsel of nectar to be brushed together and received into her honey sack, to be deposited in the hive. An accumulation of these deposits becomes an object of interest to man. For centuries he obtained it only by sacrificing the labourers that obtained it. When the natural history was understood, as it was fifty years ago, the honey taken from a new swarm—the comb being white and tender—was considered perfection, although cocoons and bee-bread occupied many of the cells, making it tough to chew and disagreeable to the taste.

In 1836 J. M. Weeks wrote a small treatise of seventy-five pages, a practical work to accompany the Vermont hive, and recommended using surplus boxes. Those that had the courage to try them learned two things: 1st. That the bees, in gathering stores for winter, would often obtain a superabundance. 2d. That this honey, when obtained, was pure, being free from pollen and cocoons of the young bee—each young bee reared in a cell, lines it with a silken cocoon. Here was a chance of obtaining the precious article without destroying the goose that laid the golden egg. It was also found that the hive producing five dollars this year could be kept to produce the same again next year. Believing in progress, I adopted this plan. My old instructor entered a protest against my "pottering so much with bees." He could not avoid the prediction that I would "run out." One of his favorite maxims was to "let bees do just as they have a mind to," and his views were orthodox. Any one experimenting to see if bees would gather stores in excess of needs, must expect to suffer for their temerity. Notwithstanding, a course of experiments was instituted that resulted successfully. Myself and a number of others, some years later, collected as surplus, in boxes, 22,000 lbs. for market in one season, taking over one thousand colonies to produce it. As bees seemed to be the only servants that were willing to work for nothing and find themselves, I became satisfied that it would pay to cultivate them, and endeavored to induce people to keep them, giving them the advantages of what experience I had, being satisfied that immense quantities of honey were wasted annually in consequence of ignorance of the subject. Facts could not come before the people without aid from the press. When Solon Robinson had control of the agricultural department of the *Tribune*, I applied to him personally to say something on the subject. He replied: "Would like to do it, but we havn't room; so much other matter in the way." Whether it pays to encourage making sugar from beets when it is necessary to go to France for a precedent to show it to be profitable, I presume I have too much interest to decide justly. It is probable that it was expected that I wanted to get a little advertising done without paying the usual fee. I encountered on the cars, one day, H. W. Beecher going to New York. I talked bees and honey, and he became sufficiently interested to go with me to the market, when I promised him a box of nice honey. After presenting it, he was told that I expected him to pay for it, giving him to understand that he was to do it by encouraging bee-keeping, till a part, at least, of what was now wasting could be saved. He replied that he "had no particular objection, but did not like to do other folks' business." I could but infer from this remark that he thought it was my business, but on what ground he based his conclusion he did not inform me. I asked myself why it was my business. I had not been paid by any one for doing it. I did not even see any great prospective reward. I could rear the bees and collect the honey in better style than any in market. Could get the highest price without competition. Enough of this.

Believing in a reward for all the good done, efforts to promote bee culture were continued. A few became interested and willing to assist. Rev. L. L. Langstroth, a pioneer in improved bee culture, and one of the most reliable and scientific apiarians in America, introduced to the public the movable comb hive. Although not the original inventor, he is to be credited with bringing it into notice and setting forth its advantages. This gave a new impulse to the subject, and an increased interest was manifested. Three or four periodicals appeared, devoted wholly to the subject, and several agricultural papers would occasionally give us an article on bees. Many new forms were given to the movable comb hives, frequently for no other reason than to obtain a patent, which was often worthless and a detriment to progress, except as it elicited discussion. The movable combs allowed us to go inside the hive, inspect every comb, bee and cell, and if not prosperous we could generally see the cause and remove it—could stimulate industry and increase our product many fold. We could increase our stocks at pleasure every good season without waiting for the uncertain notions of the bees. The fact has been a long time established that when they were deprived of their queen, and had eggs or larva present, they would rear another. This was of but little practical value heretofore, but now valuable in providing artificial swarms with a queen, and in changing the native bee to the Italian. The discovery that the simple act of the queen depositing an egg in a worker cell decides that the bee hatching from it shall be a worker, and an egg in a drone sized cell a drone, proved an item of immense value to the thoughtful, skillful bee-keeper. The instincts of the bee lead her to provide more drones than are really necessary or profitable to us. When we bring one hundred colonies together, there is no necessity for more drones than one colony would ordinarily furnish. The comb that is filled with a brood of drones has cost the bees nearly as much labor as to fill it with honey. The drone is a consumer of honey, after it is matured. Acting on these hints we have, in transferring contents from box hives to movable comb, simply rejected all or nearly all the drone comb, thereby securing, as we guess, forever after from that hive, annually, five or ten dollars additional profit. We think it pays on this account, if no other, to transfer from the box hives. We certainly prevent the waste of feeding a useless swarm of consumers. Another important discovery followed the movable combs—that is, we find it no longer necessary to make comparatively small hives, and we can secure on an average much larger amounts of surplus in large ones. Large hives have a tendency to prevent swarming. We wished to change what was only a tendency into a non-swarming certainty. We have succeeded. We learned by understanding their natural history that after a queen had flown out, and met the drone, there was no further occasion for her to fly again, except in swarming; also that the old queen led the first swarm. Now if we find this old queen and clip one wing and prevent her flying, we absolutely forbid her going with any swarm. Having movable combs, we can look them over, and remove any queen cells that may be started there, preventing any queen superseding her that can fly. By having the old queen in the old hive, depositing eggs, at the rate of 3,000 a day, and producing bees at the same rate, we soon get bees enough for two or three swarms. The

best hive is now arranged for all these bees to labor inside, instead of being outside, idle, waiting to swarm. The result is. an increased quantity of surplus. I want to show by all this that the increased yield of honey will be treble what it was, with the knowledge we possessed forty years ago, or what it is now in many places.

I want to compare the cost of honey with that of cheese, of which we hear so much. You can hardly take up a paper, of Central New York especially, but you will find several columns filled with discussions on this all absorbing subject. It was shown by a member of a farmer's club that cheese, at one time the past season, that cost 17c. per pound, sold for 13c.

Jasper Hazen, of Albany county, reports that with a few hives, on this principle, he averaged 125 pounds per hive. A young friend of mine who I expect will vouch for all I say about him, obtained in 1870 from about 300 stocks, 25,000 pounds of the best quality box honey, which sold for a price averaging nearly 30c., amounting to over $7,000. It will appear, I think, that he at least can make money by keeping bees, while it looks somewhat difficult to do it with cheese.

Suppose my friend, or any one else familiar with these preliminaries, is about commencing the business, and purchases everything: he wants 300 hives of bees, costing $5 each, $1,500; the same number of hives, $4 each, $1,200; transferring, $1 each, $300; roofs and fixtures, $1 each, $300; amounting to $3,300. This we will count as an investment for a small farm. The interest on this is $231. In addition to this annual expense he will want about 7,000 glass honey boxes, at 10c. each $700; the expense of securing and marketing the honey, call $800; the whole amounting annually to $1,731. This subtracted from $7,000 leaves over $5,000 for his labor in one season. By a few figures we see that the cost of this is less than five cents per pound. Now, I hate monopolies; yet I see no way of avoiding it with him. He has got the start and will keep it, and is entitled to it as far as any one can be.

While thousands of young men have been looking on with indifference, and waiting for "something to turn up," he has been industriously taking notes, and understands their natural history and how to take advantage of it. He has by purchase already doubled his stock from last year. If the season' 71 is as favorable as '70, he will reckon his 50,000 lbs.—instead of the past year's paltry sum, will have some $10,000 net for one year's work. He is a young man and in health, has some energy, and I would like to know what is to prevent his doubling or trebling his money again in '72, and again and again. It is fearful! Nothing but providential interference will put an end to his presumption, unless the farmers take some steps to compete with him. This I would like to encourage. Before any one, however, undertakes it, it would be well here to understand that they have some work before them. There is a class too improvident, too incapable of that minute, constant, watchful attention, that persevering industry essential to success in anything. With such the suggestion: see your bees often, every day if possible, might not be attended to—yet some little thing neglected in this way might result in heavy loss. This class is not encouraged to begin bee keeping. They *must* understand their nature and the know how. You might as well expect to get a steam engine and set it up, perfectly ignorant of its parts, and make it pay, as to set up a colony of bees and expect it to run itself profitably. Either, if put up by a skillful hand, might run a short time. It is in the nature of things to wear. There is friction in all moving things, making repairs necessary. The farmer has learned that a crop of corn is secured by skill beyond the simple act of planting. The bee-keeper *will* learn that his crop of honey is to be secured by skill beyond setting up a bee-hive.

Agriculture, which has been taught ever since the door of the first garden was closed, is not yet fully understood. Colleges are instituted to impart the science of some of the most common branches. I have shown that bee-keeping, directed by knowledge, is better than one branch of it. Let that be included in a college course. A young man, possessed of sufficient practical knowledge, could command a thousand dollars a year for his services. With ability, and without capital, he could soon acquire it to begin business for himself. Where would this young man's prosperity stop if he could procure help as capable as himself? Should such an one be out of employ, a few farmers could invest a little in bees and have them cared for scientifically. One man can care for half a dozen yards on the new principle of management, as easily as he could one on the old. Horace Greeley, when urged to keep bees, replied he had not the requisite experience to manage them. Had tried and lost them all. He lacked the knowledge. Had he possessed the practical knowledge of this young man, and taken as much pains to make it known as he has what he knows of farming, he might have added millions of dollars to the wealth of the State annually.

In proof of our progression in bee culture, allow me to compare the results of the new principle with that not so far advanced. At the American bee-keepers' convention, recently held in Cincinnati, there were present 120 bee-keepers, who owned 5,051 stocks of bees, and had sold from them 83,065 pounds of honey. It is proper to state here that some of these bee-keepers were engaged rearing queens which reduced their honey somewhat. We learn by this comparison that 300 hives produced over one-quarter as much as the 5,000. A little figuring shows us that the 5,000 might have produced over 400,000 pounds with this management. Send your man to college, educate him. If he does not care to use his knowledge in this direction it will benefit him as much as a thousand other things taught him there and never made available. It is time that our agricultural colleges had a professor of apiarian science. Some one inquires, is there enough of it to pay? What are a few pounds of honey compared to other and greater interests? Did you ever think one moment on this question? I propose to examine a little to see what we can make out of it. I requested the agricultural reporter of the *Tribune* to ascertain as near as possible the amount of honey sold by all the dealers in the city this season. He kindly gave me the aggregate, 211,000 pounds northern honey and nearly as much southern or West India. The boats of the firm at Little Falls carried to New York market 80,000 pounds. Of this amount my friend furnished 25,000 pounds. (This was all surplus; the same colonies exist yet to do the same another year.) It has been estimated from close observation that this was produced from about thirty square miles. Taking this as a basis, we can see what the State produces. Our State contains 47,000 square miles. Can you tell why every thirty miles throughout this 47,000 will not produce the 25,000 pounds of honey? If thirty square miles give us 25,000 pounds, what will 47,000 give?—39,166,666 pounds. We will say nothing about the amount produced by the other States, at present. Should you think this is more than the whole State will average? Say you deduct 9,166,666 pounds for rivers, lakes, etc., and again it will be said we have unfavorable seasons; our experience proves it. Say one year in three, this will reduce the average one-third more, leaving 20,000,000 as the product of one year! Like the manna in Israel, it is freely given, and if not taken in its season, it is gone forever. It has come and gone, for centuries. What quantities wasted in the past, because we have not had the sense to perceive our own interest. Go back fifty

years and reckon at the same rate for this State alone. We have a billion pounds wasted, actually refused when brought to our very doors. This is not the first instance of suffering for our ignorance. Our farmers suffer by paying to other States their hard-earned dollars for sweets that we might have, not for the asking—for it is already bestowed—but for the taking. Our agricultural societies have failed in their duties, in not attending to this immense waste. Instead of educating farmers to perceive and save it, they have made the premium for "best bee-hive" the most prominent, and have encouraged patents on worthless productions, thereby retarding bee culture more than by any action they have ever advanced it. In political parlance, action must begin, in "primary assemblies." This association is one. Let us ask the State society to assist with some further encouragement.

Is the question asked, what shall be done with this vast amount? I might answer by asking another, what is done with the millions of pounds of cheese annually produced? When our market is fully supplied, a few ship loads might be consumed abroad. When the price is reduced, the demand will increase in proportion. Competition of course will reduce the price, and like other farm products, we must increase the amount to make it up. Already experiments have been made showing that this amount, vast as it is, is to be doubled. It is proved by careful observation that the bees in elaborating wax and constructing combs to hold the honey as it is collected, reduces the amount more than one-half. Hives of bees in like condition setting side by side, one making combs to hold their honey as gathered, the other having empty combs to hold it provided, showed a difference of 206 pounds. One stored 155 pounds and the other 361 pounds. We have a machine to empty the honey without breaking the combs, which may be returned to the bees for refilling. Here is a difference of over 200 lbs. in one hive in one season with it. I will not attempt to show the difference in the aggregate in this instance, but enough to make us look about to find a substitute for the combs constructed by the bees. We have the machine for throwing out the honey pretty well introduced. And now, when we need it most, and can appreciate it more than at any other period since bee-keeping has been attempted as a business, we have just made the discovery that artificial combs can be practically made, and made of material indestructible by the moth worm. They are accepted by the bees, and used as their own. When the present supply of combs is used-up, we cannot well afford the honey to elaborate the wax, nor spare the time, in a honey harvest, to construct more.

Franklin says, a penny saved is two earned. This case is no exception. This is not all mere theory. I have a voucher for the essential facts. I can have no dollar and cent interest to induce others to go into bee-keeping. At the end of a few years when these things are appreciated and practiced, I shall, if I live, have the satisfaction of having contributed a mite to encourage it.

The experiments and investigations that have led to these results have cost both time and labor, and as regards myself, it may be doubted if I ever reap a pecuniary reward; but my friend, who is just now ready to make his knowledge available, may hope to do so, and cannot possibly afford the time that is fully occupied in his business, to teach others in whom he can have no particular interest. To save him the annoyance of many applications for instruction, I withhold his name, except to a few members of his association who are entitled to know.

Let us petition our agricultural colleges to give all applicants a chance for an education in bee culture, and relieve a few individuals, whose business it has been thought to be, without fee or reward.

NOTICES AND DONATIONS.

Report of the Fourth Grand State Fair of the Mechanics and Agricultural Fair Association of Louisiana, held at the city of New Orleans, April 23, 1870.

Thornton's Circular. A record of Short Horn transactions. Vol. 1, July, 1868, to December, 1869. Vol. 2, Nos. 10 and 11. April, July and October, 1870, and January, 1871. John Thornton, No. 15 Laugham place, London, W., England.

Silk Supply. Guide to Sericulture, by Thomas Dickens, Esq., J. P., with the report on the silk districts of Japan, by F. O. Adams, Esq. London, 1869, from J. Q. A. Warren.

Twenty copies of the Annual Report of the Secretary of the Board of Agriculture of Michigan, for the year 1869.

Transanctions of the Albany Institute. Vol. 6, 1870.

Proceedings of the Boston Society of Natural History. Pages 273 to 368.

Steiger's literary monthly report of the latest German publications. Nos. 3 and 4, 1870. E. Steiger, German bookseller, 22 Frankfort street, New York.

Catalogue of various classes of books, published by Messrs. Hurd & Houghton, 13 Astor place, New York.

Catalogue of the Officers and Students of the State Agricultural College of Michigan, for 1870.

Fifteen copies of the Report of the Connecticut Board of Agriculture for 1869.

By G. R. von Frauenfeld. Contributions to the Fauna of the Nicobar Islands: Upon the appearance of masses or multitudes, especially in the Animal Kingdom. The extinct and dying out animals of the earliest Earth Period. Miscellaneous Zoology, No. 16, first part. Upon several vegetable destroyers of the year 1869. Preliminary Communications concerning the work upon the family of the Psyllæ. Upon the scientific name of Aphanapterys.

Guide to the lands of the first division of the St. Paul and Pacific Railroad Company. From A. C. Smith.

The Journal of the Royal Agricultural Society of England. Second series, vol. 6, part 2, No. 12, and Vol. 7, part 1, No. 13. London, 1870.

Ten copies of the report of the Secretary of the Iowa State Agricultural Society for the year 1870.

Netherlands Meteorological Calendar for 1869. Published by the Royal Netherlands Meteorological Society.

Nineteen copies of the Twenty-fourth Annual Report of the Ohio State Board of Agriculture for the year 1869.

From A. C. Smith, Forest City, Minnesota. Annual Report of the State Auditor for the years 1863, 1866 and 1870. Report of the State Treasurer, session of 1865. Special report of the Adjutant-General, September, 1862. Governor's Message, year 1856. Minnesota, its advantages to settlers, 1868. The water power of the Falls of St. Anthony. Report of the Manufacturing Industry at the cities of Minneapolis and St. Anthony, 1868.

Ninety-six copies of the Transactions of the Illinois State Agricultural Society. Vol. 7, 1867–8.

From Hon. Horace Capron, Commissioner of Agriculture, Washington, D.C. Twenty-five copies of the Report of the Commissioner of Agriculture for the year 1869. Also the following seeds for distribution: Eight quarts white and eight quarts red Australian spring wheat; eight quarts Thanet and eight quarts Brewer's delight barley; eight quarts excelsior and eight quarts white Schonen oats; also a number of packages of vegetable

and flower seeds. Two copies of the Report on the Diseases of Cattle in the United States, 1869.

Twenty copies of the Transactions of the Wisconsin State Agricultural Society for the year 1869. Also the Report of State Horticultural Society for the same year.

Agricultural Central Gazette for Germany. Nos. 7, 8 9, 10, 11 and 12, 1870, and No. 1, 1871. Berlin. Through Dr. Flügel.

Annals of Agriculture in the Royal Prussian States. Weekly edition, Nos. 1 to 26, 1870. Monthly edition, Nos. 1, 2, 3, 4, 5 and 6. Berlin. Through Dr. Flügel.

Bulletin of the Imperial Society of Naturalists in Moscow. No. 4, 1869, vol. 43, No. 1, 1870.

Session Reports of the Royal Bavarian Academy of Science in Munich. Vol. 2, No. 4, 1869. Vol. 1, Nos. 1, 2, 3 and 4, 1870.

Report of the Royal Danish Society of Science. Copenhagen. Nos. 6, 1868; 4, 1869, and 1, 1870.

Proceedings of the Lombardian Royal Institute of Sciences and Letters. Second series, vol. 2, Nos. 12, 13, 14, 15 and 16, 1869. Sessions of 1869. Memoirs of the Division of Mathematics and Natural Science. Vol. 11, No. 2. Milan. Atti della Fondazione Scientifica Cagnolia. Vol. 5, part 1, 1867–9.

Statistical Report of the Surveyor-General of California for the year 1869.

Retail Catalogue of choice Vegetable and Flower Seeds grown and sold by J. J. H. Gregory, Marblehead, Mass.

From Hon. Erastus Corning. The following back numbers of the Transactions of the N. Y. State Agricultural Society: 4 copies of vol. 1; 6 of vol. 2; 30 of vol. 3; 25 of vol. 4, and 40 of vol. 5.

From Mr. Charles Lansing, Lansingburgh. A volume of the Transactions of the Society for 1848.

From Col. De Forrest. The Transactions for 1845, 1848, 1852, 1854, and several volumes of the American Institute.

The Prairie Farmer Annual for 1871. Chicago, Ill.

The Cornell University Register for 1870–1. Ithaca, N. Y.

From Hon. A. Welch, President. The Annual of the Iowa Agricultural College for 1871.

Report of the Board of Cattle Commissioners of Rhode Island, Jan. 27, 1871.

Annual Report of the Commissioners of Agriculture on the operations of the Department for the year 1870. Washington, D. C. From J. R. Dodge.

Illustrated Spring Catalogue, and Amateurs' Guide to the Flower and Kitchen Garden. 1871. From B. K. Bliss & Sons, 23 Park place and 20 Murray street, New York city.

From J. L. Tappan. Catalogue of the Library of the Royal Department of Agriculture; Berlin, 1868.

Retail Price List of Garden, Flower and Field Seeds, Agricultural Implements, etc., of J. Vanderbilt & Brothers, 23 Fulton street, New York, 1871.

Retail Price Catalogue of Garden and Field Seeds and Grains, of R. H. Allen & Co., 189 and 191 Water street, New York.

From G. W. Edgecomb, Lima, Lagrange county, Ind. A pair of Shehan's Pruning Shears. Manufactured by Smith Brothers, Brookfield, Conn.

Trade Circular of T. Bowick & Co., Bedford, Eng., Dealers in Manures, Feeding Stuffs, Seed Corn, Agricultural Implements, etc., 1871.

Transactions of the Highland and Agricultural Society of Scotland. 1871.

Proceedings of the Buffalo Historical Society. 1871.

Fourth Annual Catalogue of Vegetable and Flower Seeds, for sale by Wilfred Ramsey, No. 5 North Pearl street, Albany, N. Y.

From J. L. Tappan. Purdon's Irish Farmers' and Gardeners' Almanack for 1871. Dublin.

Annual Report of the State Geologist of New Jersey for the year 1870. From Geo. H. Cook, Geologist.

Proceedings of the Philosophical Society of Glasgow. Vol. 6, No. 4; vol. 7, Nos. 1 and 2. Glasgow.

Sixteenth, Seventeenth and Eighteenth Annual Reports of the Mercantile Library Association of San Francisco, Cal. From A. Stebbins, Librarian.

From Thomas F. De Voe, New York city. Coates' Supplement to the General Short Horn Herd Book, 1829. A Treatise on the Cultivation of the Mulberry Tree, and on the Raising of Silk Worms, 1828, by Wm. H. Vernon; and the American Gardener, by Wm. Cobbett, 1852.

Catalogue of the New York Mills Herd of Short Horns, the property of Walcott & Campbell, New York Mills, March 1, 1871.

Proceedings of the Albany Institute. Vol. 1, part 1, March, 1865; June, 1870.

From Mr. A. C. Smith. Annual Report of the Superintendent of Public Instruction of the State of Minnesota, 1870. Also the Annual Report of the Secretary of State of Minnesota for the year 1870.

Transactions of the Massachusetts Horticultural Society for the year 1870. Boston.

From Major L. A. Huguet-Latour. Tables of the Trade and Navigation of the Dominion of Canada for the year 1870. Ottawa, Canada.

Catalogue of the Lyndale Herd of Short Horns, the property of William S. King, Minneapolis, Minn., 1870.

Eighteenth Annual Report of the Council of the City of Manchester of the Workings of the Public Free Libraries. Manchester, 1869–70.

History and Management of the Vineyard of Blankenhornsberg, near Ihringen, by Dr. A. Blankenhorn, 1870.

Sixth Annual Report of the American Dairymen's Association for the year 1870.

From the Secretary of Foreign Affairs of Bavaria. Journal of Agricultural Society of Bavaria. Munich, 1870. Also Family and Agricultural Almanack of the Agricultural Society of Bavaria for the year 1871.

Address of George Bentham, F. R. S. Read at the anniversary meeting of the Linnean Society, on Friday, May 24, 1870. London.

From John H. Farrell, Esq. Nineteen volumes of the Transactions of the N. Y. State Agricultural Society of various years.

Hovey and Co.'s Catalogue of Flower and Vegetable Seed, etc., and Guide to the Flower and Vegetable Garden. Illustrated, 120 pages. Also Illustrated Catalogue of New Plants for 1871. 53 North Market street, Boston, Mass. Nurseries at Cambridge.

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THE JOURNAL

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State Agricultural Rooms.

The Secretary's Office is in the New Agricultural Hall corner of State and Lodge streets, Albany.

New-York State Agricultural Society.

CHEESE-MAKING.

Statement of A. L. FISH, Cedarville, Herkimer Co., N. Y., of the method of manufacture of the cheeses exhibited by him at Utica, 1870.

The cheeses exhibited by me were made at my factory, July 6, 1870, from the evening and morning milk of fifty-five cows, no cream being taken from or added to it.

The cheese is made from evening and morning milk, worked together. The evening's milk, when delivered, is strained into the cheese vat and stirred thoroughly, while cooling to sixty to seventy degrees, to allow the animal odors to escape, before the milk gets too much chilled to prevent their escape. It is then left with cold water passing around the inner vat, and exposed to free circulation of outer air over night. The morning's milk is strained into the same vat, and thoroughly stirred while being mixed with the evening's milk, to allow all hurtful odors to escape as much as possible before curding the milk. A mild, soft heat is then applied to the mass to raise it to eighty-four degrees, in warm weather, and ninety degrees when the weather is cooler and more liable to cool down more while working, before heat is applied to cook the curd, varying the setting so that the temperature of the mass will not be reduced at any season of the year below eighty-four or eighty-six degrees while working the curd before it is ripe enough to apply increased heat to harden it fit for salting. Eighty-four or eighty-six degrees is found to be the safest and best heat in the early working of the curd, because the surface of each particle of curd (made by cutting) acts as a strainer, through which the watery portion of the milk passes slowly, as it is set free by the combined action of heat and rennet. A mild and slow application of heat will not close up or clog this straining process through the outer surfaces, but a premature and sudden application of heat will tin over and clog the strainer so that each piece of curd will be like a sack, and hold the whey from passing off, and the curd will appear raw and be in a favorable condition to form acid before the rennet has finished its work. Ninety degrees is deemed more favorable for the action of rennet, also for the formation of lactic acid; therefore, when circumstances favor acidulation, low heat is used in setting, and the opposite when less danger is apprehended, keeping the setting heat, at all seasons of the year, from eighty-four to ninety degrees.

Calves' stomachs only are used; strict care is taken that the calf is in perfect health when its rennet is taken, at six days old or more. Young calves' stomachs make cheese of more plastic texture than beeves or older calves; their stomachs make harder cheese as the animal grows older. The stomach of the calf is taken out in twelve hours after the last meal, and cut open and extended with small sticks, like a leaf, the surfaces well rubbed with dry salt and hung in a dry, airy place to dry. When dry it is taken down and packed in a jar with others, pressed down and kept dry one year or more, when they are found to have changed, like cheese, from new to old, and acquire a strength which extracts much quicker and cleaner, when soaked, for use, than new rennets, and the breaking down of the curdy texture of new cheese is more rapid with old rennet than with new — not as liable to huff or swell, and less porous. A desired number of

rennets are put into a jar, and one quart of pure rain water to each rennet added, to soak twenty hours, without salt; they are then thoroughly rubbed and pressed, taken out of the first soak and put into a second, made salt to prevent tainting. The liquor of the first soak is kept, highly salted, for use. Before dipping out of the rennet jar for setting, it is stirred to the bottom to equalize the strength of liquor, because the gastric properties of the stomach are lighter than the brine and will be dipped off from the top, and leave the bottom too weak for good work.

The milk now being at a desired temperature, rennet enough is stirred into it to curd it solid in forty to sixty minutes, which time will vary with the varied condition of the milk. Close watch is kept of the time the milk is curding, and its condition, to judge correctly of its ripeness or capacity to require a slow or fast heating to scald, and expel the whey. A quick, strong set indicates a necessity for more rapid heating. The process of heating is conducted in the mildest and most equable manner, so that each particle of curd shall receive no more heat than another, which would, if allowed, destroy the uniformity so necessary to be preserved in the mass to insure a perfect cheese. When the rennet is well stirred into the milk, the vat is covered with a cloth to prevent the top being cooled while curding. The curd is deemed ripe enough to cut when it will part from the finger, like a straight cut, on raising the finger slowly up through it, leaving the finger clean of curd, and the whey that fills the cavity made by the finger appears green and clear, or when the curd will cleave from the side of the vat when pressed downward by the finger. A solid texture of curd is desired before cutting, because if cut while soft and spongy, the surfaces made by cutting will be rough, and small particles will wear off by friction, in the necessary stirring of the mass to prevent the parts from uniting again, and atoms thus separated lose their gravity and float off with a milky whey.

When the curd is ripe enough to cut, it is cut through and through with a steel knife of eighteen blades, which leaves it in strips one-half inch thick, and left to separate whey to cover the surface; then cut with the same knife crosswise, leaving the mass in bars one-half inch square; then the mass is cut with a gang of knives set to cut horizontally, leaving it in one-half inch cubes and of uniform size, which is deemed fine enough for ordinary working of the curd; but when there is danger of early acidulation the curd is cut finer, because the whey will separate quicker and with less heat, which is deemed expedient, even at a waste of weight in the cheese.

No rule is observed as to time in cutting curd, except that all movements made in the process are slow and with a steady hand, so that the subdivisions shall be equal through the mass. All the changes are made during the process of manufacture with a view of preserving a perfect uniformity of all the parts acted upon by the agencies used.

When the curd appears somewhat shrunken and covered with whey to float it, and strong enough to not mash or break by handling with the hands or agitator, a mild, slow heat is applied to the water in the lower vat, to spread as evenly as possible around the curd vat, at the same time, so that no part or particle of curd shall be over-heated or cooked faster than another. A slow, careful motion is given to all parts in the curd vat, with the hands or agitator, so that no particle of curd shall rest against the heated surface of the vat, or become attached one particle to another; for if several particles of curd are allowed to adhere and form lumps, they will resist the effects of heat in the cooking process, as though they had not been cut finer in the start, and will produce a like result when pressed into cheese All motions necessary to keep the curd swimming in the whey while cooking, are made from the bottom upward, which moves the curd to the top of the whey and makes it take a longer time to settle and rest against a heated surface; consequently there is less friction and waste of curdy matter. The curd is never allowed to rest upon the vat while heat is raising to cook the curd, because curd is a non-conductor of heat and will not convey an increased heat to the mass until overheated and spoiled itself. The time occupied in raising the mass to scalding heat (ninety-eight degrees) as the condition of the curd requires, is from one to two hours. If the curd has a weak set, or comes soft, more time is required in raising heat, as it will not do to apply a strong heat to a weak curd; hence the strength of heat must be applied to keep pace with the action of the rennet.

Heat is applied by Miller's coil heater, which throws the heat evenly through the water that surrounds the curd vat, leaving the bottom of the vat coolest where the curd is most inclined to settle and rest, which I deem highly important in cheese-making. If a part of the curd is allowed to rest in contact with a surface heated much above the point fixed for cooking the mass, it will be overheated and changed in condition from other parts less heated, consequently will not unite harmoniously to make a perfect cheese. Cheese made of curd thus partially treated will never be right. The maximum heat used in cooking the curd (ninety-eight to one hundred degrees) is held to its highest point from one to two hours, till the curd will spring apart on being pressed quickly in the hand, and will squeak on being pressed between the teeth, and will fall heavily, like gravel or grain, when dropped into the whey.

When heat and rennet are supposed to have done their work, the curd is left in the whey till a slight acidity is apparent in the whey, which is supposed to facilitate the *cheesing* or breaking down of the curdy texture of the new cheese, and guard against its huffing and becoming porous. Less heat and salt are used in spring in working hay-milk and more as the heat of the season increases and the milk grows richer, because poor curd will absorb all the salt that is applied, like lean meat, while a rich curd will reject salt, like fat meat, and more salt will drain and press out of it after being salted, and because rich cheeses will ferment more rapidly than poor, and require more salt to control them and keep them firm when exposed to high heat. In working hay-milk in spring, no acid is allowed to be developed in the whey, because cheese made of poor milk ferments and breaks down slowly, and if acid is allowed to predominate, the cheese will be light, dry, crumbly, and unfit for early market.

The whey is drawn off with a syphon, and the curd dipped into a draining sink with slats so arranged in the bottom of the sink that the whey will pass off freely, to get the curd dry enough to salt while it retains its full heat, because the salt shrinks the curd more if added when warm than when cold, and more whey is shrunk out of the curd, if salted warm, than can be pressed out after the curd has become cool and then salted, and the curd is better and more evenly tempered thereby.

The curd is kept fine and thoroughly mixed in salt-

ing, then packed up and covered in one end of the sink to steep in salt for half an hour; it is then spread in the sink and thoroughly stirred while cooling to eighty degrees, so that it shall be cooled and tempered alike before going to press.. Two and a quarter pounds of Ashton salt is used to one thousand pounds of milk or one hundred pounds of pressed cheese; the curd put to press and pressed lightly first, till the whey that presses out is clear, then pressed to the full strength of the press and hoops for one or two hours, then turned into fresh cloths made wet with cold water, or into bandages which are not removed; they are then pressed as before till the next day, then turned again and pressed twenty-four hours longer; no fear is entertained of pressing too hard for the good of the cheese. Curd is cooled before going to press. because a low temperature suppresses the combined action of heat and rennet (which are active decomposing agents) and aids the new agent (salt) to acquire a controlling influence over antagonisms that may exist in the constituent parts of the cheese, and because a high temperature is more favorable to acidulation while pressing. causing the press cloths to stick to the cheese when turned, and if too much acid gets possession it will cause the rind to crack while curing, lessen the cheese in weight, and cause the meat of the cheese to be hard, dry and crumbly.

Putting curd to press too warm, and pressing too long and hard before turning into fresh cloths, sour rennet, sour press cloths or press boards, hoop or followers, are each fruitful causes of press cloths sticking, and when all are combined may be expected to make bad work. Dipping press cloths into cold brine before applying then is a good preventive. Fine, slack-twisted cloth is better than coarse, hard-twisted, for press cloths, as a warm curd, hard pressed, will press through coarse cloth and clinch against the hoop, and peel off the rind when removed. Cleansing the hoops and cloths often with lye is a preventive, as it keeps them from imparting acid to the rind of the cheese.

When color is desired in cheese, liquid anatto enough to make the curd a bu ter color is stirred into the milk with the rennet. To color the outside, anatto is put into the grease or oil that is rubbed on to prevent their cracking.

Plenty of sharp, sweet rennet and a thorough scald, with sweet curd. prepares the cheese for a firm, smooth rind. If curd is pressed raw, it retains too much moisture, which sweats out and keeps the rind soft and porous, with a sticky, rough surface. When the cheeses are taken from the press they are placed upon the shelf to stand one hour or more, till the surface appears dry, then greased all over with hot oil made from whey butter, applied with a swab or brush, so that it will penetrate the rind and close the pores and make them impervious to air and flies, after which they are turned daily and rubbed with the hand or an oily cloth, as they require, to keep them smooth till cured for market. If any break or marring of the rind occurs, the wound is filled with cheese nearly like it, to a level, smooth surface, and covered with a patch of tissue paper or fine cloth, and well oiled till solid and safe from flies.

Cheeses are caused to swell by using rennet that has swollen in soak, or got a slight taint from some cause, or when its action upon the milk may be weakened by excessive heat coming in contact with the curd while scalding, or the milk in the process of heating, as an excess of heat above the natural temperature of the stomach will weaken its digestive powers, so as to leave such portions of curd, thus exposed, unlike other portions, to be welded together in the same cheese. Or if the curd has not been cooked enough, by reason of the scalding heat having been raised too fast for the action of the rennet, or has been cooled too much before salting, the curd rejects salt and it is pressed out in the whey that is pressed from the cheese, so that it is slack salted. Or being put to press too warm, a fermentation will continue too strong for the salt to control, and it will incline to swell like rapidly decaying animal substances. Each of these conditions may cause cheese to swell while curing. A sure remedy will be found by adhering closely, in practice, to the principles herein given.

The thermometer is used in all stages in the process of manufacturing cheese, to test the heat, in heating and cooling milk and curd.

A. L. FISH.

THE PRINCIPLES OF BREEDING DOMESTIC ANIMALS.

From the Mark Lane Express, Nov. 21, 1870.

Mr. T. F. Jamieson, Lecturer on Agriculture in the University of Aberdeen, delivered the first lecture of the season, on this subject. He said, of all the various departments of husbandry, the rearing of live stock is perhaps the most interesting in which the farmer can engage, and also the one that holds out the highest prospect of reward to those who can prosecute it with ability and success More especially is it so in our country, which has outstripped all others in this pursuit, and has become famous over the whole world for the excellence of its various breeds of cattle, sheep, and horses; so much so that men come from all parts of the earth to purchase that blood which they can nowhere else find in the same degree of perfection, and which improves every other with which it is mingled. Every one must have remarked the immense difference that often exists between animals in regard to the progress they make upon the same sort of food. You may have two cattle of the same age and tied up together in the same stall, getting food and treatment precisely the same in every way, yet the one will remain obstinately lean while the other will get as round and fat as an alderman. Two cows may be feeding in the same pasture; the one gives abundance of milk, the other almost none. Here. then, it is evident there is a great waste of food in the one case compared with the other. Both may consume the very same quantity, but they differ greatly in the way they dispose of it. The object the farmer has in view is to convert the vegetable produce of his farm into beef and mutton, and what he wants is an animal that will do so to the greatest advantage. Mr. M'Combie tells us that there is a kind of cattle in the northern parts of Scotland which he calls "Highland Hummlies," a race of starved vermin which he considers the worst of all breeds. No kind of feed will move them much. The choicest specimens are distinguished by a brown ridge along the back. They can, he says, be made older, but they defy even his own well-known skill to make them much bigger or fatter. Food, as he rightly tells us, is entirely thrown away on such animals. On the other hand, he points out that beasts of the right sort grow and feed rapidly; there is no difficulty in making them fat; the difficulty rather would be in making them lean when once in good condition. Evidently, then, it must be very unprofit-

able for a nation, as well as unsatisfactory to the individual farmer, to have a race of cattle like these Highland hummlies, which Mr. M'Combie abhors, and, fortunately, there is no difficulty in obtaining plenty of the opposite kind.

Again, differences equally striking may be seen in regard to dairy produce. Some animals appear to be nothing less than machines for turning grass into milk. A good dairy cow will give 500 gallons of milk in the course of a year, yielding 150 lbs. of butter, but some will give much more than this, and some much less. Some cows when at their best will give as much as 7 or 8 gallons a day for a time, others only 2 or 3. Now, if we want dairy produce, it is of the utmost importance to select animals having this natural adaptation for the purpose, and it is generally found that these qualities will be inherited to a considerable degree by their offspring. The art of the breeder consists in developing the type of animal suited for the purposes for which it is to be kept. The dairyman wants a beast that will give a maximum of good milk; the cattlefeeder one that will grow and feed rapidly, and experience shows that these desirable qualifications can be perpetuated, and that races can be formed which will continue to manifest the same properties. Whether it is possible to unite these two advantages in the same race, is a subject which I will not at present stop to discuss, but it is manifest that it would be a very desirable object to attain. A breed that would combine in the same animal the property of giving an abundant supply of good milk, and of producing offspring that would either grow and feed rapidly if put to fatten, or be good for the dairy if kept for milk, this would be a combination of the greatest excellence. Opinions differ as to the possibility of uniting these two qualities in a high degree of perfection, and, at all events, it is certain that it is very difficult to succeed in it.

In proceeding to establish a breed, it is of the utmost importance to start from a right foundation. It is comparatively easy to select good animals. but it is a slow and difficult task to improve them. For example, if we were to take a lot of those bad Highland beasts, which Mr. M'Combie has so strongly denounced, and try, by gradual selection and careful weeding, to rear from them a fine race of cattle, our chances of success would be small indeed. It is an old saying that you cannot gather grapes from thorns nor figs from thistles, neither can you get good beasts out of bad ones. The progress of improvement in the individuals of any race, when kept entirely by themselves, seem to be very slow indeed. A rapid advance may be made by crossing with animals of superior blood, but unless this can be obtained, we cannot expect to make any very speedy improvement. Accordingly we see that our most successful breeders have taken great pains to procure the best animals they could anywhere find as a commencement to start from, and their prosperous results have in a great measure arisen from the judgment and skill with which they made their first selection. The late Hugh Watson of Keillor made a very great improvement upon the black polled breed of cattle, and it would perhaps be difficult to point to any old animals of that race nearly so fine as those he succeeded in producing. He was the first great improver of the breed, and all the finest herds of polled Angus and Aberdeenshires are more or less indebted to his blood. It may be said, here was a great and rapid improvement effected, and a succession of fine animals reared from ancestors much inferior in type. I am aware that I may be treading on somewhat delicate ground when I say that many people, however, believe the great and notable advance made by Mr. Watson and our modern breeders of black polled cattle in the form and quality of that race has not been entirely effected without the aid of other blood. As a well-known breeder once remarked to me, while pacing along the polled ranks at one of our shows, "We never used to see these finely modelled hind quarters in the black cattle until the Shorthorns found their way to the North." It is a well-known fact that the produce of even the first cross between a Shorthorn and a black-poll will sometimes turn out to be quite black, and destitute of horns, although in other respects it may retain many of the excellencies of the English breed. Some of these first crosses have actually won prizes at our cattle shows as pure animals; so that it is perfectly clear a great improvement might have been effected at the outset by some measure of this sort. I doubt, therefore, whether the marked advance effected on the polled breed forms an exception to the rule I am insisting on, namely, that we cannot very rapidly improve a race by mere selection from themselves—we cannot get animals to produce stock much better than either themselves or their ancestors. Any great stride will usually be effected by the introduction of some better blood, if such can be got.

John Price. the great breeder of Hereford cattle, tells us that, in commencing to form a herd which should possess the form and qualities he thought most desirable, he, after much search fixed upon the animals belonging to Mr. Tomkins of Wellington Court, near Hereford, from whom he purchased a considerable number of cows and heifers, and three bulls. These cattle were of smaller size than other herds he saw in Herefordshire, but had more of the good properties of the model he had in view than any others he could meet with. He at first attempted to improve this breed of Tomkins by crossing them with larger cattle, apparently with the view of increasing their size; but the result was so unfavorable, that he put away all these crosses, and returned to the pure Tomkins. This Mr. Tomkins, we learn, began breeding his stock so long ago as 1769, commencing with two dairy cows which his father-in-law had purchased, and which he observed had an extraordinary tendency to thrive and grow fat. The one with the most white he called Pigeon, and the other, of a rich red, with a spotted face, he called Mottle; and from these he reared his two lines, the Mottle tribe and the Pigeon or Silver tribe. We see, therefore, that Price built on Tomkins' foundation, and Tomkins himself started with animals of unusually fine quality, no doubt themselves descended from a good sort.

When we inquire into the history of the Shorthorn breed, we find a similar method of procedure. Thomas Bates tells us that the Dukes of Northumberland had cattle of this sort in their possession a couple of centuries ago, and that Sir Hugh Smythson, one of the ancestors of the family, paid the greatest attention to the breeding of these cattle, regularly weighing the animals, together with the food they ate, so as to ascertain the improvement made in proportion to the food consumed. This was more than a century ago, and prior to the time when Bakewell became celebrated as a breeder of live stock. Bates' famous Duchess tribe is descended, he tells us, from this old stock of Sir Hugh Smythson. Bates got them from Charles Colling, who he says, repeatedly assured him that they were

the best cattle he ever had or ever saw, and that his first cow of this tribe was better than any he could produce from her, though put to his best bulls, which improved all other cattle. Colling had bought her from the Duke of Northumberland's agent at Stanwix in 1784. Such is Bates' account of the matter, and at any rate it is quite clear that Charles Colling, the great breeder of Shorthorns, who first brought the race into prominent notice, took the utmost pains to find out the finest cattle in his neighborhood, and that he at length succeeded in gathering the cream of the best tribes that then existed in the North of England, and from this nucleus he developed his herd, to which, as to a fountain head, we trace all the best blood of the present day. By this means he availed himself of the previous care and skill which had for generations been bestowed by former breeders, and thus saved whole centuries of time; for improvement of any pure stock is, as I have already said, a very slow process. One of the very best tribes in Mr. Colling's possession was got by him from Mr. Maynard, of Eryholme, who had carefully bred them for a long time. It was the custom of the Maynards to bring 16 bullocks and heifers to Darlington market on the first Monday of March. The bullocks were from four to five years old, with fine wide horns, good bone, and very deep flesh, and were keenly looked out for year after year on the pavement opposite the King's Head. Mr. Thornton tells us that Charles Colling's farm-overseer had previously been with Mr. Maynard, and some remarks of his led Colling and his wife to take a drive one fine day over to Eryholme. When they arrived, their attention was attracted to a fine cow which Miss Maynard was engaged milking. Colling offered to buy the cow and her calf, and, after haggling on both sides, the purchase was made for thirty guineas, and Maynard gave him a long pedigree of them, going back as far as the time of the murrain of 1745, which would show that their breeding had been carefully attended to, and recorded half a century before the "Herd Book" was thought of. Robert Colling is reported to have told Mr. Wiley that neither his brother's cattle nor his own were better than those of their neighbours, until they got these two beasts from Maynard. This same cow which was bought from Mr. Maynard was the grandam of Colling's famous bull Favourite, to whose blood almost all the best Shorthorns of the present day trace their lineage. Colling, therefore, appears to have picked up all the plums he could find, and to have started from the best stock that was to be got in his day; and all subsequent breeders of Shorthorns who have attained to any celebrity have drawn from the blood of this famous herd. Bakewell, who seems to have been as skillful a breeder as Colling, nevertheless failed in producing so fine a tribe of cattle, probably because he began from a worse stock.

Having got the best sort, it is of the greatest importance to stick to it. We see that Price tried to improve Tomkins's choice Herefords by crossing them with a larger race, but he found he was wrong, and had to retrace all his steps; and Thomas Bates, the celebrated breeder of Shorthorns, tells us that he never used any bull that had not the Duchess blood, without immediately perceiving the error, excepting Belvidere, and he was come of a long race of well-descended Shorthorns, whose blood traced back to Colling's Favourite. The late Richard Booth, of Warlaby, was also most averse to the introduction of any new blood into his herd. It is only by continued propagation from the same sort that fixity of character can be got, and every mixture of fresh or foreign blood introduces unlooked-for elements of confusion. Mr. Tomkins told Price that he had bred the whole of his fine stock of Herefords from two heifers and a bull selected by himself early in life without any cross of blood; and Mr. Price himself, whose stock was celebrated for their excellence, says that he continued to keep the blood of these cattle unadulterated for forty years, so that for eighty years in succession he and Tomkins had kept them pure and unmixed with any other stock. Breeders have often been struck with the character of the West Highland cattle, and many seem to have thought advantage might be derived from an intermixture with their blood. John Price, of Hereford notoriety, seems to have taken them as his model. "Among cattle," he says, "the Highland Scot approached more nearly than any other animal to the standard of form which I considered the true one This decided me in adopting them as my model. I was desirous of possessing a breed of cattle on a somewhat larger scale than the Scotch Kyloes, yet having the same symmetrical loggy form, with similar coat and texture of flesh." Long ago Mr. Charge had heard Bakewell say that, from the West Highland heifer he thought the best breed of cattle might be produced. Charles Colling likewise made some experiments in this direction; and so impressed was Thomas Bates with the capabilities of this breed, and the possibility of developing something more excellent than had yet been seen by uniting them with the Shorthorn, that he persevered in the attempt for nearly thirty years, having at one time nearly one hundred breeding cows of the cross between the Highland heifer and the the Messrs. Collings' Shorthorn bulls, and sparing no pains to procure the finest cattle from the West Highlands that could be got. In the end, however, he gave it up entirely, finding apparently that the Shorthorn breed was not improved in this way. Robert Colling, the brother of Charles, and only second to him as a breeder, also experimented with the West Highlanders, and frequently tried the cross between the improved Shorthorn bulls and the best Kyloe cows he could procure. The produce made very fat, but he eventually gave up the attempt, finding the pure Shorthorns to be better. Mr. Charge seems also to have tried it, and several gentlemen in Aberdeenshire and Banffshire. There is no doubt that the Shorthorn improves the Highlander, as it does all other breeds; but the Highlander gives no good to the Shorthorn. Mr. John Wright, a well-known judge of cattle, and a cotemporary of the Collings, says—"Improvements have often been anxiously sought for by crossing with other breeds, and many valuable specimens have been exhibited; but it may be asked, What breed is there that can improve the Shorthorn? I have seen many extraordinary animals from the cross with the West Highland Scot, but we do not find their offspring uniformly improving by each succeeding cross: there is great uncertainty in their progeny. The polled or Galloway Scot progresses with less variation in the produce, and continues to improve by subsequent crosses; but neither of them gives anything to the Shorthorn, though the Shorthorn adds much to them." As Mr. Wright tells us, it answers very well to cross the polled Galloway or Aberdeenshire with the Shorthorn bull, and by continuing to cross the progeny, always taking care to use a pure Shorthorn sire, no bad result will follow, for in this way, in the course of a few generations, you approximate very near to the pure Shorthorn. And, in fact, it is just in this way that the present race of Aber-

deenshire cattle have, in a great measure, originated: but this is a different thing from attempting to form a new breed which should possess characters intermediate between the two.

The experiments of Mr. Darwin throw a curious light upon this subject. He has shown that, if we take two races which breed perfectly true to their kind, and unite them together, we often get features in the progeny entirely different from those of either of the parent stocks, and he has further shown that these new features are, in some cases at least, a reversion (or *cry-back*, as some of our cattle-breeders would say) to an older type from which both the varieties have been derived. The crossing, in other words, has often the effect of causing the re-appearance of long-lost characters that existed in the original stock from which both the breeds have descended. For example, in the case of domestic pigeons, which are believed by naturalists to have been all derived from the common Rock Dove, Darwin found that, when he matched together individuals of two distinct races, which always bred true to their kind when kept pure, the produce of the cross sometimes showed a plumage quite unlike that of either of the two races, and approximated in colour to that of the wild Rock Dove, the source from which both races are supposed to have been derived. A similar remarkable result was obtained with domestic poultry. He crossed individuals of the black Spanish breed with the white silk hen—the one as black as coal, the other as white as snow; and from the union of these he got a bird with much red in its plumage, and coloured almost exactly like the wild Indian fowl, the *Gallus Bankiva*, which is believed to be the original parent stock of all our various breeds. Mr. Darwin adduces many other facts of a similar nature, all going to show that crossing gives a remarkable impulse to this tendency to reversion; so that, if we breed from mongrels, we may expect to find some very unexpected results turn up in the progeny. It is no doubt the experience of something of this sort that causes many breeders to be so shy of introducing new blood into their herds. The subject of reversion is a very curious one. It may be occasionally remarked that a child will resemble its grandfather or grandmother, or even some remote ancestor, much more strongly than its own immediate parents. This is what is termed an instance of reversion. But the observations of Mr. Darwin show that this property may be occasionally developed to a most unlooked-for degree, and that features will now and then re-appear of some far-off progenitor, separated by hundreds—aye, thousands—of generations, and that crossing of distinct races has somehow or other a remarkable tendency to bring out such results. But, although crossing has this effect, it must not be supposed that it always does so, or even that the instances will be numerous. Neither is reversion confined to crosses, for instance will show themselves even in the purest breeds. For example, the occurrence of small horns, which often happens in polled breeds of cattle and sheep, may be looked upon as cases of reversion. Darwin says there is reason to believe that sheep in their early domesticated condition, were brown or dingy black, and several ancient writers describe the Spanish sheep as being black, red, or tawny, and he attributes to reversion the occurrence of black and dark-coloured lambs which are sometimes dropped by Southdowns and other pure-bred sheep. Even the Leicesters, which have been very carefully bred since the time of Bakewell, now and then throw grey-faced, black-spotted, or even wholly black lambs. The frequent occurrence of white animals in the Shorthorn breed of cattle, notwithstanding the general dislike to this colour, may be explained on the doctrine of reversion. It is well known that white cattle were at one time very common in England, and there is reason to think that some of the original wild breeds were white. It has also been observed that in various pure breeds of the domestic pigeon, blue birds, having the characteristic marks of the wild Rock dove, will occasionally appear. There is no doubt, however, that such cases are comparatively rare, and the general experience of breeders shows that any remarkable divergence from the established type of a particular race is unusual in well-bred animals. But we must not, on this account, suppose that instances of reversion are rare in pure breeds, for reversion is a fact of constant occurrence, and seems to be one of the essential attributes of inheritance. The non-divergence from the type on which we may genearlly calculate in well-bred animals is rather to be explained by the fact that reversion usually extends back for only a moderate number of generations, and seeing that pure-bred animals are descended from a continuous succession of individuals, all of the same type, such cases of reversion only serve to bring out the usual features of the race. For example, let us suppose that we have some cattle of the Shorthorn breed, whose progenitors have all been good beasts for ten generations. Now, if cases of reversion extending back as far as the fifth generation are uncommon, and still rarer beyond that we may be pretty sure that the progeny will be tolerably good, for on whatever ancestor of the ten the resemblance lights, something of the true sort will still be the result. Hence the value of pedigree, and the use of the herd-book. As Darwin well says, the principle of reversion is, perhaps, the most wonderful of all the attributes of inheritance. What can be more curious than that features which have disappeared for ten or a hundred generations should suddenly reappear in full development? There is reason to believe that all characters which thus occasionally reappear are present in a latent form in each intermediate generation; and in every living creature we may feel assured that a multitude of lost characters lie dormant, ready to be revealed when the proper conditions occur to develope them.

We must learn, therefore, to distinguish between inheritance and development. The germs of many things may be inherited, and yet never be developed, because opposing circumstances prevent their manifestation. This is well shown in the case of diseases. It is not at all uncommon to see a hereditary disease pass over a generation, and reappear in the grandchildren. Such instances are familiar to medical men, and in cases of this sort no one, I presume, can doubt that the germs of the malady have been transmitted through the intermediate generation, notwithstanding its apparent exemption, and that there was a latent tendency to the disease in that generation, although circumstances did not allow its developement. In order, therefore, to fix the type, we must keep to one sort. It is only by continuing to breed from good animals that any dependence can be placed on the excellence of the progeny; and if a certain form and style are wanted, a race must be reared from individuals not only themselves distinguished for these qualities, but which have sprung from ancestors in whom the same qualities have been inherent for generations. The characters thus become intensified in the blood, and will reappear with certainty in their descendants.

With the view of stamping the type more firmly in the race, many of the most successful breeders of domestic animals have had recourse to the system of matching together individuals very nearly related in blood. Such has been the course pursued by Bakewell, Colling, Bates, and others. This is what is called in-and-in breeding. It is, however, a system that requires to be pursued with great judgment and caution, and only succeeds in the hands of a master; for although it no doubt has the effect of more speedily attaining certain objects, yet it is equally certain that a great deal of bad consequences have in many cases resulted from it. Many breeders, seeing the success that attended the practice in the hands of Bakewell and Colling, have attempted to follow it, to the ruin of their herds. With animals of great excellence, and of very robust constitution, it may apparently be hazarded to some extent, not only without injury, but with great prospect of advantage. The characters of the wished-for type become more strongly pronounced, and their progeny retains them with greater completeness; and notwithstanding all that has been advanced in opposition to the system, it is an undeniable fact that our most eminent breeders of Shorthorn cattle have pursued it in founding the races for which they have become famous, and many of the finest animals they have produced have been bred in this way. In-and-in breeding in the case of our domestic cattle, when managed with judgment and skill, seems to bring out the tendency to fatten more decidedly. It gives greater fineness of bone, and seems to intensify the family character by concentrating the blood of that particular type which the breeder wishes to develop; but if the system is persevered in too long, or is attempted with unsuitable animals, experience shows that vigour of constitution is rapidly lost, and the race becomes delicate, and subject to disease. There is even some reason to suspect that vigour of constitution is occasionally lost by a race of animals when long reared in the same spot under similar conditions of food and treatment, even although they are not closely related in blood, and that good will result from transporting them to another quarter, where the climate, soil, and food are somewhat different. When a race has become too close-bred, an infusion of fresh blood has the effect of increasing the size, vigour, and fertility of the animals. Fineness of quality may be lost to some extent, but growth is almost always gained. Farmers who breed for mere commercial purposes, and have no regard for any particular breed, generally like to have a frequent change of blood, as the animals seem to be healthier, their calves are more easily reared, and grow better. Breeders of Shorthorns, on the other hand, who have attained a high reputation for their stock, and whose animals are sought after by foreign purchasers, who buy much by pedigree, find that they require to be very cautious in introducing fresh blood into their herds, even from other herds of pure descent. Such mixtures often disappoint expectation, and derange the character of the tribe to an unlooked-for degree; but, when a right hit is made, and a good sire of fresh blood is got, the value of the infusion is immediately and decidedly felt. Such was the effect of Belvidere, for example, on Bates's Duchess tribe, and of Buckingham on the herd of Richard Booth. Buckingham was not himself a very fine animal to look at, and no visitors to Warlaby, we are told, could appreciate his merits until they saw his offspring. "Never," says Mr. Carr, "were calves with backs so broad, ribs so round, shoulders so shapely, flanks and fore-quarters so full and deep," and there seems no reason to doubt that the freshness of the blood had much to do with this effect Buckingham had on the Warlaby herd.

In improving any race of animals, breeders have proceeded upon the principle that like begets like, or, in other words, that the offspring will inherit the qualities of the parents. They have therefore gone to work by continually selecting the best animals to breed from; and it is by this constant selection of the best, carried on for a long series of generations, that our present breeds of domestic animals have attained their high degree of excellence. Although everyone admits the truth of the proposition that the characters of the parent may be expected to reappear in the offspring, yet the rule is subject to much modification, for we constantly see that the degree of resemblance varies much even in members of one family, all proceeding from the same parents Some of the offspring will resemble the father, some the mother, while in others the features of both will be blended, or the resemblance may take after some of the grand parents or collateral branches of the family, or even revert to some remote ancestor. Breeders of animals also observe that some individuals transmit their characters to their progeny much more strongly than others, and, in short, one would be inclined to say that the laws of inheritance are very capricious and unaccountable. This, however, no doubt arises from our ignorance, for the subject has not been studied with that amount of attention which it deserves. Physicians and life insurance companies know well how vital a matter inheritance is in regard to the chances of life and liability to disease; but those who have paid long attention to the breeding of animals can perhaps best appreciate its importance, and are most fully aware how completely the form and character of the individual depend upon the antecedent nature of its progenitors. The laws that regulate inheritance have been surprisingly little studied, considering their vast importance, and are consequently but very imperfectly understood. Most breeders, however, seem to believe that long-continued transmission of any character tends to implant it more firmly in the race, and hence pure-bred animals, which are descended from a long succession of ancestors endowed with the same features and qualities, will transmit these characters with a considerable degree of certainty to their progeny. This is what is meant by pure blood, or high blood, and it is alleged that, if we match two animals, one of pure blood and the other of mixed descent, the character of their progeny will generally most resemble the pure-bred parent. If, for example, we use a well-bred Shorthorn bull, with a set of cross-bred cows of no particular breed, the features of the Shorthorn will generally predominate in the offspring. As Mr. Berry expresses it, the excellences of the one are the accumulated acquisitions of many ancestors, they are positive, and in comparison fixed, while the cows possess little or no determinate character, having been bred without regard to any point save to increase the stock on the farm where they were reared. If, on the other hand, the sire and dam are both equally well bred and alike in point of individual excellence, then the produce may be expected to have an equal chance of resembling either parent. For example, it may often be observed that pure-bred cows of the Black Polled breed, when crossed with the Shorthorn, have often calves which are entirely black, without horns, and show little of the Teeswater type.

Certain French breeders have found the same rule hold

good with sheep. It would appear that in France the native breeds are very inferior to the English sheep, more especially as mutton-producing animals, having been reared more with a view to the fleece than the carcase; and, in order to remedy matters, several farmers have tried to change their flocks altogether by substituting the improved English breeds. It was, however, soon found that none of these had the constitution suitable for the climate of France, and, accordingly, this led to attempts at crossing. For this purpose, rams were introduced of the Leicester, New Kent and Southdown breeds, but the results at first obtained were unexpected and unsatisfactory. All these improved English breeds of sheep are of comparatively modern origin, compared with the native French races with which it was sought to match them. More especially is it so with the Merinos, which are a very ancient breed, and, in point ef purity of blood and long descent, far excel the English races of comparatively modern origin. It was accordingly found that most of the lambs of this first cross resembled the French ewes far more than they did the English sires; some showed no trace of the improved breed; while a very few represented pretty equally the features of both parents. When the ewe was a pure Merino, it often happened that the lambs showed scarcely any trace of the English breed at all. The ewes, in short, as Mr. Berry would have said, had more positive characters, owing to their longer-continued purity of blood, and, therefore, resisted more successfully the influence of the new blood. Some of the ewe-lambs of this first cross which partook of the English character were retained, and recrossed with the pure English ram, and the produce of this second cross, we are told, did resemble the father more than the mother, and the fleece also partook of the English character. They, however, proved difficult to rear, which the French writers say is always the case when the proportion of English blood exceeds fifty per cent. Observing these results, a certain breeder bethought himself thus: We see that the blood of our pure native breeds is too strong to be influenced sufficiently by a single cross with the English sheep. Let us try how we shall succeed by first crossing some of our native races together, so as to break down the purity of breed, and then on this mixed produce, let us try the effect of the English ram. As we cannot increase the antiquity and purity of the English improved breeds, let us diminish the resisting power—namely, the antiquity and purity of blood in the ewes. And he tells us that, with this view, he selected sheep from some of the border provinces of France, where two races meet and mix together, and, by uniting some of the mongrel races together; taking care, of course, to choose as good animals as possible, he thus obtained in their offspring a set of sheep of very mixed blood, in which the influence of breed was almost annihilated by the multiplicity of its component elements. The ewes thus bred he put to a pure English ram of the New Kent breed. From this union he therefore obtained a lamb which, as breeders would say, contained fifty per cent of English blood, the other fifty being made up of say twelve and one-half per cent of four different French breeds. Here, then, we have a heavy preponderance of English blood, if we compare it with the blood of any one of the pure French breeds, so that the effect of the latter would tend to counteract one another, and be individually lost, leaving the English type in the ascendant. The experiment, we are told, proved perfectly successful, and the result strongly confirmed Mr. Berry's proposition that the purest blood will transmit its qualities most decidedly to the offspring, irrespective of sex. Not only did the lambs all partake largely of the improved character of the English type, but they were also of a very uniform character, much resembling one another. By this means a cross-bred was got, retaining the improved features of the English sheep, and yet having no more than fifty per cent of English blood, which, as I have already mentioned, is as much as the French authorities say will suit the peculiarities of the climate of France.

I may further mention, in regard to the point I have just been considering, that the late Earl Spencer, who was himself an enthusiastic and successful breeder, long ago remarked in regard to cattle and sheep, that the worse bred the female the more likely is the offspring to represent a well-bred sire. Although, therefore, it would seem that the force of inheritance is strengthened by long-continued transmission from generation to generation, it is nevertheless found that when a new or accidental variety turns up it will sometimes be inherited with considerable strength, and, by careful selection, may be perpetuated in the race. It is from accidental sports of this nature that gardeners have reared many of their choicest flowers. The white face of the Hereford cattle is a very fixed character in that breed, and if we can believe the following story, it arose from an accidental occurrence of this sort: The old Herefords are said to have been brown or reddish brown, and it is only within the last hundred years that they have become whitefaced. The history of the introduction of the latter variety is thus given by Mr. Rowlandson in his account of the farming in Herefordshire. His informant had got it from Mr. P. Tully, and the circumstance is said to have occurred in the stock of one of that gentleman's ancestors. One day about the middle of last century the cattleman came to the house, announcing as a remarkable and extraordinary fact that the favorite cow had produced a white-faced bull-calf. This had never been known to occur before, and being a curiosity, it was agreed that the animal should be kept and reared as a future sire. The offspring of this bull became famous for their white faces; which have since prevailed in the cattle of that county. I have, however, some doubts as to the authenticity of this story, from the fact that Andrew Knight, who was himself a noted breeder of Hereford cattle, states that Lord Scudamore, who died in 1671, introduced some whitefaced cows from Flanders, and that such a breed existed there seems likely from the circumstance of the painters of the Flemish school occasionally introducing them in their pictures.

Here is another case. What was known as the Otter or Ancon breed of sheep is said to have originated from an accidental variety or sport which occurred at Massachusetts, in America, in 1791. A ewe, we are told, gave birth to a male lamb having a long back and short crooked legs like an otter. As it was thought the variety might be useful for not leaping fences, a breed was raised from it (which, however, I believe is now extinct) termed the Otter or Ancon breed. When crossed with other sheep, it was remarked that the offspring were not intermediate in character, but resembled either one or other of the parents individually, and this occurred even in a case of twins. Another more recent case of a breed of sheep originating from a single sport, as gardeners would term it, comes from France. A male lamb was produced at a farm in France, in 1828, among a flock of Merinos, remarkable for its long,

smooth, straight and silky wool. A breed has been since raised from it, having fleeces of the same peculiar quality, and which are so valuable that they sell at 25 per cent above the price of the best ordinary Merino wool. In this remarkable lamb the long, smooth wool was accompanied by smooth horns, and some other deviations from the ordinary character of the Merino sheep. It seems very likely that our polled cattle owe their want of horns to some such accidental departure from the common type, which had been seized upon and rendered permanent by careful selection and weeding out of horned animals. These, and other instances I might adduce, would therefore lead us to believe that a new feature may occasionally turn up and be transmitted with considerable force, and by taking advantage of an animal showing some unusual excellence of this sort, a decided step may now and then be made in the improvement of a race. Apart from lucky chances of this kind, the breeder has chiefly to depend on his skill in selecting, and here come into play the advantages of that fine eye for animals which all our successful breeders of stock are distinguished for, and without which it would be vain to hope for any great degree of success. Good judges—real judges—appear to be rare. At least so thought Thomas Bates, who used to say that hundreds of men may be found fit to be Prime Minister of England, for one that is a right judge of Shorthorns.

Besides the effect of skill in selection, a good deal lies in the proper treatment of animals. The best beasts may be spoiled by bad management. Docility and quietness of disposition, which are points of so great importance, depend greatly on how the animals are used. A kind and gentle way of treating them, if uniformly persevered in, has a magical effect, and there is no doubt that too little attention is paid to this matter. Bakewell's cattle were noted for their gentleness, and this was owing to the uniform kindness with which he caused then to be treated. And here there must be selection also, for temper runs in the blood like other things. Animals of a wild and vicious disposition should not be kept for breeding, however excellent they may otherwise be, for there is every chance the fault will be inherited, and every one knows what a pest even one wild beast is in a herd. The animal nature responds wonderfully to kind treatment. Every one has heard of the Arabs and their horses; how these children of the desert excel us in the usage of these fine creatures, and how generously the noble steeds answer to the call of their masters, without the rough appeal to whip and spur which is too common with us. Sir Charles Knightley, well known as a breeder of Shorthorns, was still a more celebrated brilliant horseman. He had a famous hunter called Benvolio, the best he ever rode, but in the hands of another man this horse would, in all probability have turned out a useless and vicious brute. The first trial of him seemed only to show that his most distinguishing characteristic was an utter aversion to all sorts of jumping exercise. Sir Charles took him out alone one morning, and endeavored to bring him to reason, but in vain. Stock still he stood, and no power on earth could induce him to take a fence. His rider came home to luncheon somewhat disgusted—but not discouraged—cast down, but not in despair. After a glass of Madeira, he brought him out again still patient, good-tempered, and persevering. The animal that would have resisted coercion to the death, was at length subdued by kindness, and from that day Benvolio became the finest hunter in England. The marvellous feats he performed with the Baronet on his back are yet related with wonder and admiration. One spot is pointed out that still goes by the name of "Knightley's leap," which degenerate horsemen of modern times gaze at with dismay, declaring that even on a second Benvolio, no consideration would induce them to ride at it. Here then is a fine instance of what can be done by a gentle and masterly hand. Again, there is no doubt that treatment is of much importance in developing the size and expansibility of the animal frame. Good shelter and plenty of food, given regularly, without intervals of starvation, have evidently the effect of increasing the size and early development of cattle, and the best breeds can be stunted and spoiled in course of time by an opposite system of hunger and exposure. I must, however, draw my remarks to a close. The topic is a wide one, and would take a series of lectures to go into in detail, but the observations I have now made will serve to show some of the principles which ought to guide us in rearing the live stock of the farm.

ROTATION OF CROPS.

BY THE HON. GEORGE GEDDES.

(From the New York Weekly Tribune of May 12, 1869.)

The idea of preserving the fertility of land, and at the same time greatly increasing the aggregate of crops produced, by a judicious rotation, is quite modern.

In England great attention is paid to rotation, and many elaborate experiments have been made and reported in the agricultural works of that country, showing its importance and its influence in increasing the agricultural productions of the kingdom.

English writers have marked out with much care various systems of rotation of crops, giving the proper place to each, in view of the food it demands of the soil, and its power to appropriate the food that may be derived from the different stages of decomposition of the various manures used.

The only useful lesson we American farmers can derive from all this English knowledge is the proof that a proper rotation does preserve the fertility of the soil, and greatly increase its products, when the aggregate is considered.

The climate of England is so unlike ours that we must strike out for ourselves in laying down our plans of rotation. We have a climate that matures in its perfection the most valuable cereal, all things considered, that a beneficent Providence has given to man—that England cannot produce in the open air at all—I refer to maize or Indian corn, a native of our own country, and adapted, in its different varieties, to nearly every part of the United States.

Admirers of English systems of agriculture have long urged on the American farmers extensive cultivation of root crops. Though constantly urged thereto the practical Yankee has gone on raising his Indian corn, well knowing that as a leading crop it was beyond all comparison of more value, in view of its cost, than any root crop, for his own food, or for food for his cattle, sheep and horses. Near cities root crops will be cultivated; but far away from markets, where land is comparatively cheap, the wise farmer will only produce roots for special purposes, such as feed for ewes having lambs in early spring, or as a condiment for some pet animal. For special reasons, a farmer of my acquaintance has his lambs yeaned in December and January, to the number of two or three hundred. This man raises about eight acres of roots to feed with his dry

hay to the mothers of these lambs, and by the time grass comes the next spring, these lambs weigh fifty, sixty, or even more pounds each. This man can afford to do as he does, but his case is a very peculiar one.

The stalks of an acre of corn are generally considered by farmers in Central New York to be worth as much as an acre of hay to feed their stock in winter. The stalks should pay for the whole cost of the corn crop up to husking. The acre of grain should average not less than 2,500 pounds when dry. One pound of corn will feed a fattening sheep one day, and eight pounds will feed a fattening steer a day, the proper quantity of hay or other forage being given in each case.

The Illinois farmer is quite as likely to continue to raise great fields of Indian corn, and go on feeding it in his wasteful way, and totally neglect raising roots to feed his cattle, as the Englishman in Canada is to follow up his traditions and feed roots during his hyperborean winters. At any rate, all exhortations to the Western corn-raisers on this point are useless, for he thinks he knows what he is about—and he does.

With these preliminary remarks we will discuss the question of rotation, counting Indian corn in, and root crops out.

OUR ROTATION.

First Year.—The land having been well seeded with timothy grass and medium red clover, the first crop taken is hay.

Much difference of opinion has existed, and perhaps still exists, as to the proper time to cut hay. This point has undergone such full discussion that it is not worth while to go over the ground at this time. I will assume that the proper time is when the plants have reached their greatest growth, which will be readily known by their being in full bloom. Timothy and medium clover do not arrive at this stage of growth at the same time, and of necessity one must be cut too early or the other too late. The clover being by far the most important is taken as the guide. But the farmer who has a large hay crop to make cannot delay until even the earliest is quite ready. He must begin his haying a little early, and then he will finish it a little late in the season.

In Central New York, about the 20th day of June, haying commences, and on large farms occupies about one month of time. The best methods of conducting this important business I do not propose to discuss here, though I have some very positive notions in regard to them.

As soon as the hay has been removed from the ground the clover starts a new growth, and if gypsum is applied and warm rains come, by the middle of the month of September there will ordinarily be a fine crop of seed matured and ready to cut. This seed crop has varied with us from one to seven bushels to the acre. It is not the custom here to cut this seed crop close to the ground, but to leave a very considerable proportion standing. We do not wish to get much more than the heads, preferring to leave most of the stalks on the ground. Of course, in doing this we do not get all the seed.

In the seed crop the timothy shows but little, but it has helped make a good sod, and was of considerable value in the hay crop. The crop of hay should not average, for a series of years, less than two tons to the acre, weighed the next winter, and the seed crop should average three bushels to the acre.

This is the way we manage the first year of our rotation, taking two valuable crops.

Second Year.—This year is devoted to pasture, with the expectation that each acre will abundantly feed one cow in an ordinary season.

Gypsum sown about the first day of May on this pasture brings forward the white clover which abounds, *self-sown*, in our pastures, and the timothy and natural grasses will make a dense sod several inches thick, and the red clover roots will get to their greatest depth and size, such of them as are left.

Third Year—Indian Corn.—About the 10th day of May plough the land in the most perfect manner possible, and deep enough to bring, on top of the reversed sod, a sufficient supply of soil that is not held too firmly together by the grass roots to allow of harrowing and marking without disturbing the sod. The roots of the red clover will be either cut off by the plough or drawn out by it. Six or seven inches will be about the best depth to give the ploughing.

Indian corn is a gross feeder, and will send its roots through the sod and down below it to a great depth, unless the subsoil is so hard they cannot penetrate it. As the grass roots decay they furnish food to this wonderful plant. I say wonderful, for in about one hundred days an immense crop of stalks, and perhaps 3,000 pounds of the richest grain (second only in its fattening powers to flaxseed) will be produced.

When the crop is sufficiently ripened, it should be cut near the ground and put in "stooks" to cure; and no cattle should be allowed to tramp over the field in the late autumn or early winter, to make tracks in and puddle the soil. In warm climates, where the larger varieties of corn are raised, this process of harvesting cannot be adopted, and on sandy or other loose soils it is not so important to keep cattle off the field.

Fourth Year.—Barley or oats are sown on the corn-stubble, the ground being ploughed but once, but that one ploughing being done perfectly, after the ground has properly dried in the spring, cutting narrow deep furrows Some farmers entertain the opinion that barley is the best crop to precede wheat. If the ground is clean, that is, free from Canada thistles and other bad weeds, it is; but, if the ground is not in first rate condition in this respect, oats are better.

Barley must be sown early to warrant the expectation of a good crop. Oats should be sown two weeks or so later than barley. By sowing an oat crop late, time is given for the thistles and other foul stuff to commence growing, and make quite a show above the ground before the ploughing; then a perfect ploughing does much for their extirpation, and the warm weather that at that time of the season may be reasonably expected, will force the oat crop forward, and give it greatly the start of the weeds, and thus the crop will out-top and keep under these pests. Another consideration is the character of the soil, in deciding whether barley or oats shall be selected for the crop of the fourth year. Barley delights in a clay soil, and but rarely does well on a quick, sandy soil.

Whichever of the crops may be selected, the treatment of the land after harvest is the same. The stubble being raked clean as possible from all the grain; if the land is not clear of the weeds, plough it, shallow, say four inches, at once, and harrow so as to insure the growth of all the grain left on the ground, and the bringing to the surface the roots of weeds. At this season of the year the sun is usually hot, and the weather dry; and six weeks of summer fallowing in August and the forepart of September, properly managed, will do much toward freeing the land from even couch (quack) grass, especially if the roots are gathered by a strong steel-toothed horse rake, and then drawn off the field and destroyed.

If the land is free from foul stuff, the best course is to turn on the stubble sheep or young cattle, and let them pick off what they can, until near the time for sowing wheat, and then plough once perfectly, and harrow for the next crop, which will be wheat.

Fifth Year.—In the fall of the fourth year wheat was sown, and with it, by a device connected with the drill

six quarts of timothy seed. In the spring of the fifth year red clover is to be sown. When the wheat is harvested the ground should be all covered with clover and timothy, which are to make the meadow or hay crop of the first year of the next rotation.

This is the five-year rotation as practiced by the best farmers of my acquaintance, when no circumstances cause a modification—such, for instance, as the failure of cloverseed to take and grow well; or, perhaps, an uncommon demand in the market for some one crop.

Our farmers expect, as the proceeds of this five-year rotation, from each acre two tons of hay, three bushels of cloverseed, the pasturage of one cow for a season, fifty bushels of corn, and the forage produced by the corn crop, forty bushels of barley, or fifty bushels of oats, as the case may be, and twenty to twenty-five bushels of wheat.

If the ground has previously been well tilled, and is not infested with foul weeds, each grain crop is raised by one ploughing. Land free from stone and all other obstructions, and that has been previously properly managed, can be perfectly cultivated by one ploughing, that is the furrow can be turned over and pulverized, if the right plough is used, and the right man has the holding of it.

Modifications of our Rotations.—To carry out strictly the five-year rotation we have to suppose the farm to be divided into five equal parts, and that the owner will find it to his interest to raise crops in just the proportion laid down. As has been already suggested, for various reasons this is not always so, and thus modifications are from year to year made—some of them will now be stated.

The yield of grass the first year after the wheat has been taken off is much greater than it is the second year, that is, a larger crop of hay can be cut the first year; there is more clover this year than afterward. The convenience of the farmer often causes him to pasture the first year, until late in August, and then by one perfect ploughing turn in all the clover that he can, and sow wheat. By just this process we have produced crops of wheat at the least cost per bushel of any we have raised. A case occurs to me in which we treated a twenty-acre field in this way, and got thirty-three bushels to the acre. This was the cheapest wheat to us of any ever raised on the farm.

The next year this land went into barley, followed by wheat, when it was again seeded to grass.

It has, in some few instances, happened that wheat has been sown on wheat stubble, thus taking two wheat crops in succession, sowing grass seed on the second crop. But this can be justified only on land in high condition.

Various other modifications that will readily suggest themselves to the minds of grain-raising farmers, become necessary or very convenient. But the leading point is constantly kept in view. Fill the ground with clover roots and the roots of grasses as often as practicable, and then kill them with the plough, and convert their decomposed substances into grain.

A farmer, who is an entire stranger, writes me a long and valuable letter making many important suggestions, for which I am obliged to him, and quotes from a former article of mine a sentence which he asks me to reprint, and put it in capitals, and as it expresses about what I want to say just here, I comply with his request —THE GRASS CROP IS THE BASIS OF ALL IMPROVEMENT, WHERE IT CAN BE MADE TO GROW WELL.

At what time in the Rotation should the Barn-yard Manure be Applied?—For some years I have been trying to learn the best methods of taking care of and using barn-yard manure, and now I am ready to confess my lack of knowledge in regard to this important matter.

Farmers that raise much grain, and keep a proper stock of sheep or cows to consume their coarse fodder, or, if not *consume* it, to *trample it under foot* during the winter, and get it in condition to be applied to the land, make immense quantities of manure that costs them much labor to handle, and it is always a matter of great interest to them to learn the best methods of doing this work. I do not propose to enter into the discussion of this topic now, but will state the practice most approved here.

Sheep are the best farm stock to manufacture manure. Properly wintered under sheds that can be closed against storms, having small yards connected with them, sheep will trample much straw under foot, and will dispose in like manner of the coarser part of the corn stalks so well, that twice or three times during the winter the manure can be drawn on sleds from the sheds and yards, and spread on the snow that then covers the pastures and ground designed for the next year's crop of corn. The manure must be quite fine to justify its being put on the ground designed for corn. Spread on pastures a bad flavor is given to the grass next year, but aside from this objection, I know of no place where it does so much good. A pasture treated in the winter to raw, unfermented manure, will be so strong in grass, and the soil will become so rich that, whether ploughed the next summer for wheat, or after being one year grazed, and then put into corn, that the maximum yield may be reasonably expected. This winter manuring costs the least of all methods, and probably saves the most of the value of the manure of any known to me.

But the barn-yards of a productive grain farm will be covered in the spring a foot or two deep with the butts of corn stalks, straw, and manure from cows, young cattle, etc., that will be so coarse that it requires reducing in bulk by fermentation. This matter is pitched into large piles in the yard, from time to time sprinkled with gypsum, and about the first of July the sides of the piles cut down and cast on the top, to promote the decay of the part of the manure that has been so exposed to the air that fermentation has been very slight.

Thus treated this coarse manure will be so reduced by the time that wheat is to be sown in the fall that it can be drawn out and scattered on the *top* of the wheat ground immediately before harrowing and drilling in the seed. Selecting that part of the wheat ground that most requires help, we top-dress it with this rotted manure, not mixing it with the soil more than the harrow and drill buries it with a very slight covering.

This last described method of handling barn-yard manure is vastly more expensive than the one first given; but, all things considered, I know of no better way to take care of the coarser parts of it.

In this very summary statement of our methods of using barn-yard manure, I have avoided arguing the controverted points that are involved—some of them may come up for consideration at a future time.

Rotation of Crops Involves Mixed Agriculture.—There are sections of country where rotation of crops and a system of mixed agriculture is impracticable. And there are districts where the plough cannot be used at all. But a very large proportion of this country is in all respects well adapted to the production of a great variety of crops, and to the support, at the same time, of large flocks of sheep, or herds of cattle. Wherever mixed agriculture is practicable, it results in vastly increasing the grand total of the yield of the fruits of the earth.

That strange tendency of the American mind to run to extremes in everything appears among the farmers as strongly as anywhere else. If fine wool happens to be profitable to raise, a fever takes hold of the owners of flocks, which soon becomes a mania. Individuals become noted as breeders. Some fancy name becomes famous, and the sheep of certain men rise in price,

first to hundreds, soon to thousands of dollars each, until a single animal has been sold for the price of a farm adequate to the support, when managed by a rational man, of an ordinary family.

This sheep fever in due time results in over production of wool ; low prices follow; men begin to rub their eyes, as though waking from some strange dream, and the bubble bursts. A reaction follows; good sheep are slaughtered by the thousand, saving only their pelts and tallow, and the business of wool-raising, as a regular branch of farming, is as unduly depressed, as at the time of the popular insanity it was unduly elevated.

A few men have made money; many men have lost money; but there has been one real gain. Sheep have been greatly improved, and the knowledge of the best manner of managing flocks has been very much extended.

It would hardly be safe for a man who wishes to live a quiet and peaceable life, to name that special branch of farming, in this connection, that has so long enjoyed a foreign demand for its productions, and is now in the acme of its success. But for the sake of the prosperity of this business, it certainly is to be hoped that our politicians will not commence a suit for the damages done us in the time of the rebellion by the Alabamas that swept our commerce from the seas, in that only court to which nations bring their grievances for settlement

The prosperity of a nation's agriculture must be based on the production of a great variety of staples, if it be possible, the production of all the raw material for the food and raiment of all the people. Thus the nation is made independent of all other peoples in time of peace or of war.

True as this is of a nation, it is really no less true of an individual farmer, so far as his soil and climate will permit him to diversify and increase the variety and number of the products of his land.

Farm Stock with Grain-Raising, is Necessarily Connected with a Proper Rotation.—In the rotation suggested in this paper one-fifth of the farm is pasture, beside the pasturage derived in the early spring from ground that is to be ploughed for corn, and that which is derived from the fields from which wheat has been harvested. The wheat stubbles will, without injuring the grass, give a large amount of pasture—at a time when usually most desired—that will be fresh, and much liked by the farm stock.

A grain farm, under a proper rotation, will carry through the summer a large stock, and produce none the less grain, if we take a period of, say ten years, into account. This farm stock, in the winter, will work the cornstalks and straw into manure. In fact, the stock is a necessity to the grain farmer in the winter. Before the grain raisers of Central and Western New York understood this thing, the straw from their grain was a great incumbrance, and much of it was burned up immediately after the grain was thrashed, in the fields where it grew.

To sum this matter up, a proper farm stock, over and above the teams, cows, etc., necessary to meet the wants of the farm, can be supported on a grain farm with very little cost, except the care and attention required.

It may be said that the straw, corn stalks, etc., might be sold for money. Near large towns this may be true, but it is not true away from such markets. But it should not be sold off the farm, unless the owner of the farm intends to sell the soil within a few years. The barn-yard manure made by cattle and sheep, by tramping this coarse forage under foot, is an important matter in that system that looks to making a farm self-sustaining and self-improving.

A well managed grain farm should sell grain, clover seed, meat, wool, cheese, and butter—but not hay, corn stalks, or straw, until it has become so fertile by its own self-sustaining and creative powers that too much straw is produced in the grain crops. Then, perhaps, it will do to sell a little hay—when it brings a large price.

Such persons as have done me the honor of reading my communications lately published in the *Tribune*, will have learned that I believe in a farm sustaining itself, and that with very little aid from outside, it should be, by judicious cultivation, carried to the very highest point of production that the climate will allow. I fully recognize the inherent differences in soils, and their adaptability to special crops, and I do not say that the exact methods I have pointed out are applicable everywhere. But I have no sympathy whatever with that school of writers who appear to think that the world is going to ruin by reason of the deterioration of the farming lands.

There is a period in new countries in which bad farming is almost universal; then comes the necessity of reform, and reform becomes the order of the day. So far as I know, farming is now improving in all the older sections of the country, except, perhaps, in the neighborhood of cities. The temptation to raise hay and sell it at high prices in a great city, leads to the worst farming that has come under my notice. Whenever I hear a farmer say that he pays $50 or $60 an acre for manure to put on his fields, and then learn that this manure is mostly straw that has become stained a little in some city stable, fifty or more miles from where it is applied as manure, I am quite apt to tell that farmer that his money has been badly laid out, and that in a proper system of mixed husbandry and with a proper rotation of crops, he would have saved this expense.

ON REARING CALVES.

From the Mark Lane Express of May 29, 1871.

BY THE NORTHERN FARMER.

At the present season this subject engages the attention of stock-breeders to a large extent, the healthy progress of young cattle being a matter of very serious importance, much loss resulting to owners if they grow up puny or badly-thriven; and, on the other hand, the profit and satisfaction is considerable when they do well, becoming the very foundation of future prosperity. To have good calves worth the trouble and expense of rearing some foresight is necessary, the parents requiring to have, as far as possible, good frames, fair size, and sound constitutions. It is useless to rear a calf out of a delicate cow, as however well attended to, it will be always weakly, and hard to keep in condition, never at any time preserving a creditable appearance amongst the rest of the stock, and never able to give a return for the expense incurred in rearing and feeding. To have sound healthy stock should be the leading object of every breeder, and this can only be accomplished by selecting parents of sound constitution, and sending away every calf as soon as born which is deficient in stamina, narrow across the loins, flat-ribbed or too light of bone. Weeding them at birth prevents much after-disappointment, and saves both trouble and expense, as, after feeding a delicate calf for a few weeks, one is loath to get rid of the young creature, even although palpably not worth the trouble of rearing. Mere smallness of size I count no objection, as, if well-formed and healthy, a calf of good breeding can be forced into growth by liberal treatment, and at weaning-time the difference will be scarcely perceptible between those which were dropped of a fair size and those that were under the average at birth. The offspring of badly-bred bulls are not worth rearing, however healthy they may be, large of frame or otherwise promising, as, with only ordinary advantages, in the shape of food and shelter, young cattle which are bred from pure bulls will shoot far ahead of them, and will be worth while but yearlings from three to five pounds a-head more than those which have the disadvantage of being cross-bred from both sire and dam. At a fair in the beginning of April I saw well-bred calves ten months old, in but very middling condition, sold by a farmer for six pounds each, while his neighbour who

stood alongside him could not get an offer for his two-year-olds, although asking actually less money than the other got for his calves. Every effort should be made by the owner of breeding stock to procure good bulls. If the cows are few in number, two or more neighbors should join and get a good sire with a pedigree, and where even this cannot be accomplished a few of the best cows should be sent to a bull of breeding and character, and the service paid for. In the case of breeding young stock a fair start is more than half the battle, as from the time they are able to shift for themselves they are worth money and will bring it without trouble, while those that are cross-bred from both parents can scarcely be converted into cash until of such an age as to enable the purchaser to calculate with some precision what he will be able to turn them to so as to reimburse him for his outlay. There is neither profit nor satisfaction to be got by putting good and expensively grown or purchased food in bad skins, it never will or can pay. With good blood so widely diffused as it is at the present day, there is really little temptation to breed from cross-bred stock, and to continue doing so shows a large amount of carelessness and indifference to their own interests on the part of those who year after year carry out a system which should be obsolete. Apart from good blood, there is still another matter to be looked to, so as to ensure as far as possible the dropping of good healthy calves, which will be worth taking the trouble to rear. This more particularly refers to the treatment of the cows when carrying calves, as if they are milked too long, or insufficiently supplied with food when dry, the offspring will be more or less affected, and a certain proportion of the members of a herd will if neglected at this time be sure to throw puny, wretched calves, quite unfit to be held over for feeding purposes, or for reproduction. If a cow is a free milker, no doubt the temptation is great to draw the milk from her as long as she will give it in any quantity, and this more particularly when there happens to be a good market for dairy produce. If a good bull has been provided for the stock, and rearing the calves forms a regular and important branch of industry in connection with the dairy business, milking to within a few weeks of calving time becomes very short-sighted policy on the part of those who permit such a thing to be done. It is clear that the fœtus must be imperfectly nourished, when there is such a continual drain on the system of the dam, and what is made in one way is surely and unavoidably lost by the other; viz., the impaired constitution, and in consequence, decreased value of the calf. From eight to ten weeks is little enough time for the cow to be dry when a good healthy, well-developed, calf is desirable; and its extra value will fully repay its owner for the slight loss sustained in the decreased quantity of milk. January and February calves do well if the arrangements of the dairy permit of their being properly attended to, and the cows properly nourished during the period of gestation. They are reared and ready to go out to the pastures by the time the grass is sufficiently forward to afford a full bite, and are hardy and strong for the following winter. As a general rule, however, the month of April is the most suitable time for the bulk of dairy cattle to calve. It is first of all more natural, the springing is assisted by the genial weather, the udder is much better filled in consequence, and the cow is in better condition and health than when she calves in the dead of winter, even with a short interval of rest previous to parturition. This necessarily tells on the progeny, the calves being dropped firm and strong on their limbs, stouter of body, and well fleshed. Young cows calving very early in spring are exceedingly apt to get wrong in the bowels, lose condition rapidly, and if at all of a delicate constitution will remain thin for years unless permitted to lose a season, which renovates the constitution, and restores them to good condition if there is a possibility of its being recovered. I may remark *en passant* that permitting a very thin cow to run well into the season before calving—say from end of May till beginning of July, will generally have the effect of permanently strengthening her, completely overcoming the tendency to excessive leanness so frequently displayed by kindly milking cows of the very best breeds. The cow having brought forth her young, the young animal should be removed from its dam whenever she has licked it dry. On no account should it be permitted to suck, as its doing so provokes an infinity of trouble, the mother on its removal withholding her milk with the expectation of its being restored, and the calf obstinately refusing to swallow a drop of milk until absolutely starved into submission. The annoyance thus given by both animals is intense; this, however, being not altogether the greatest trouble involved, as there is imminent danger of the udder becoming inflamed and the cow sustaining serious injury from retention of the milk. Where the object in keeping a breeding herd is principally for rearing cattle of good blood, every other consideration being sacrificed or at best but secondary, then decidedly the calves should be suckled, the necessity for hand feeding being in such a case completely negatived. Every calf intended to be reared should be allowed to partake of the biestings, nature's medicine, without which the little creature so recently ushered into the world cannot possibly survive, or, if perchance it may do so, it is only to drag out a miserable existence for a few weeks. Although comparatively easy to get calves to drink, when gone about in a proper manner, it is exactly the opposite when attempted by a hasty-tempered or ignorant person who endeavours to do by force what can only be accomplished by gentleness and patience. The instinct of the calf teaches it to raise its head and strike against the vessel which contains the milk, while the ignorant attendant keeps pushing the head down. Others, to save themselves trouble, put their finger into its mouth, keeping it there until the habit has been formed; and the calf, by-and-by will not touch the milk until the hand is introduced. In teaching the calf to drink, there is no better plan than to open the mouth with one hand, which is easily done by slipping the arm under its neck, keeping the mouth raised at the same time. With the other hand the milk can be lifted out of the pail and poured into its mouth, when it is compelled to swallow it. The first feed may be given in this way, and possibly the second, if it may appear necessary; but after that there need be no further trouble taken; the calf, having acquired the habit of swallowing, will drink freely without the slightest assistance. This mode of teaching a calf to drink saves a great deal of after-trouble and annoyance; nothing more being required than to place the milk before it. Prevention of contact is of the utmost importance where there are a number of calves being reared together of mixed genders; they are less liable to accident, and enjoy better health. Separation by cribs so arranged as that the occupants can see each other is undoubtedly the best mode of preventing contact as they can stir about and benefit by the exercise. Such accommodation is, however, not attainable by ordinary farmers, and they must content themselves with tying them by the neck. However unnatural it may seem at first sight to tie calves of a fortnight old by the neck, it answers wonderfully well in practice, and is altogether so convenient that anyone beginning to follow it out will be very reluctant to leave it off, and, in fact, is not at all likely ever to do so. A leather strap with buckle is the most convenient fastening, a swivel being attached to the cord connecting it with the post to prevent the possibility of an accident. Separation is the only cure for sucking, a habit which calves cannot be kept from when loose, and which is often the cause of serious loss. In this way also the food can be given to each animal with great exactness, every one getting its own share, however shy or timid; and if there are some tedious in drinking (which often occurs), they may take their own time without any danger of being robbed by the others. For this reason it will be found that the smaller or weakly calves come on quicker than when a number are fed out of one trough, the strong in the latter case invariably pushing back the weak. The young animals do not seem to suffer from want of exercise, as might very naturally be assumed, but on the contrary thrive rapidly, preserve an amazing appetite, and if properly fed, are always in excellent condition. When sucking is thoroughly prevented, there is no danger of loss from hairs introduced into the stomach, and getting impacted into a hard ball, a fruitful source of mortality at some seasons, the poor things dying in

frightful agony, and generally just at the age when they are all but reared. Twice a day is quite often enough to feed a calf, giving a third meal involving a certain amount of extra trouble, besides interfering with the milk which has been placed in the dairy, always an unpleasant thing for either mistress or maid who takes charge of it. The stomach being cleared by the action of the biestings, and digestion fairly commenced, there is little difficulty in keeping the young animal in healthy thriving condition. To sharpen the appetite half-a-gallon of new milk will be sufficient for each meal during the first four or five days, gradually increasing the quantity until it reaches two gallons a day, more than that being scarcely required for any calf intended to be held over for store purposes. About the tenth day a portion of good skim milk may be substituted, slightly increasing it each day until the sixteenth or so, when the new milk may be altogether withheld. In the early months of spring and summer calves thrive well on good skim milk, and by the time the weather becomes warm enough to cause coagulation, they do equally well on the thick milk, fattening on it if supplied in abundance. For the quantity of milk to be given a calf at each meal there should be no special rule, each animal after being fairly started getting as much as it drinks without repletion, its fully rounded sides being an excellent and unfailing indication of enough having been drunk for that time. An objection may be made by many that the skim milk is here proposed to be too early substituted for the warm milk as it comes from the cow, but I say it advisedly, that it will not pay the ordinary tenant-farmer who breeds cross-bred cattle, to continue to give it longer than from a fortnight to three weeks. If he does so it interferes with his other arrangements regarding the disposal of his dairy produce; and however unlikely it may appear in theory the difference between two lots of calves at weaning time, which have been fed, the one on new milk and the other on coagulated milk, will not be perceptible unless the former is given in much greater abundance than any ordinary rent paying farmer is likely to give it. Large numbers of the veal calves that reach the English markets from Ireland are fed purely on thick milk, the cream being taken off, and the unbroken mass then placed before the animal, which is permitted in this case to drink to repletion. Calves reared for merely store purposes are, in the great dairy districts of the Province of Munster, invariably thick fat when weaned, with grand bone and substance, although not a particle of trouble was taken with them in any way, otherwise than supplying them with abundance of coagulated milk. It is astonishing how soon calves will nibble at a bit of sweet hay when hung up temptingly before them, and when about a month old it should be placed within their reach, as it helps to preserve them in health, keeping the stomach and bowels in tone; it is, moreover, a source of amusement to the little things, and teaches them to eat. In May, when the days begin to get warm and fine, the early calves can be gradually accustomed to the open air by letting them out a few hours in the middle of the day; in a very short time they will become perfectly hardy, and may be allowed to remain out night and day. If put out too suddenly the coats will stare, and growth be checked for a considerable time. The cold-searching winds which generally precede rain at this season are highly injurious to young animals newly turned out of a warm house, and they should not be permitted to remain out under its influence. It is a wretched sight to see a lot of young calves standing with their backs arched and coats staring, while the rain beats pitilessly on them, and from this also they should have protection, until warm weather has decidedly set in. When calves are weaned it is highly essential for their well-doing that they should be supplied with abundance of water. A very little neglect on this point will undo much of the good already done, and undermine the foundation of good health and sound constitution so carefully and expensively laid during the previous four months.

PIG BREEDING AND FEEDING.

(From Bell's Messenger, May 29, 1871.)

The same rule applies to pigs as to other farm animals—choose a good breed, especially in the male parent. Where there is a great natural tendency to fatten, follow the advice of the late Mr. Fisher Hobbs, who said, when selling a breeding sow, "Let her work hard for a living; don't feed her bountifully, or she will get fat and have no pigs, or very few." There was wisdom in this; but remember that the kind of food you give her is a most important consideration. The fœtus cannot be properly formed unless the materials are of the right sort, for there must be the elements of bone, muscle and fat—the latter alone is of little use; therefore avoid the fatal mistake of giving to the sow a large quantity of roots before parturition. The same mistake is often made with sheep and cows. If a sow is allowed to range at large, she does well, having access to pasture, because in a good pasture we have a great variety of plants, possessing various and valuable qualities—aromatic, condimental, and others, generally available to the juvenile formation and development, which the natural instinct of the animal teaches her to select. This may be supplemented by pollard, bran, a little meal, boiled potatoes, and a few swedes or white turnips, but very few mangolds, especially when fresh and succulent. A moderate supply of peas, beans and barley, or soaked Indian corn may be added; also tares, clover and green beans with the pods on. Cabbage is very safe food. Nothing comes amiss to a sow. The great point is to take care that the food should consist of a variety and not, as is too often the case, be confined to one sort, especially roots. After parturition roots may be much more liberally given, and especially cabbage, in conjunction with other food; but as the period of parturition approaches, and especially immediately after parturition, to guard against fever, the diet should be sparing and cooling. I know some who invariably give an ounce of Epsom salts in the liquid food to the sow after parturition. After recovering from the excitement, the necessary materials for milk-making must be contained in the food. Cottagers are often successful with their sows, where they have a chance of roaming in lanes and coming home to receive a little meal, boiled potatoes, pot liquor, vegetables, etc. In cold weather, warmth and shelter are essential. Never allow a pig to bury itself in stable manure, or make holes in the floor and lie in them, for cold will strike the heated side and give him heaves or lung complaint. Young pigs, when taken from the mother, should have pollard, a little meal, and a variety of food, but especially skimmed milk with fine pollard or middlings, and as they grow older, peas, soaked Indian corn, etc. A few roots and green food are always acceptable. For fattening pigs nothing beats one-third pea meal and two-thirds barley meal, if mixed with skim milk so much the better. Pigs may be fattened very rapidly by steamed roots mixed with meal or boiled potatoes, the food given warm. Although bulky looking they will not weigh so well, or eat so well, as those fattened on pea and barley meal, with or without milk. I was very successful in fattening pigs or large hogs in hot weather by placing them on sparred floors, with a pit under them. There is a natural tendency in pigs to huddle together; if placed on soft barley straw there is no circulation of air under them, therefore, stiff, reedy wheat-straw is much to be preferred. They get fever in hot weather, unless there is circulation of air around them, and plenty of water. The latticed or sparred floors have an immense advantage in this respect. The urine all passes through and away, and they lie clean, cool, and dry, with an air circulating around them. Pigs naturally deposit their solid excrement in a corner away from their bed. When barley was 18s 6d per qr. I fattened about 400 pigs, and was always very successful in avoiding disease; they were all placed on sparred floors. In hot weather we showered upon them occasionally from the jet about 80

gallons of water per minute; after the first alarm they enjoyed it, their skins became as clean as the back of one's hand, and they fed and prospered most satisfactorily. It pays to give a pig when he first comes from market a good scrubbing with soap and water. In winter it is necessary either to put some straw upon the sparred floor, or to enclose the place so as to keep it warm, providing sufficient ventilation. Pigs pay (in manure) as well or better than most animals, but the meat market will not carry a heavy supply, for, unlike beef or mutton, it is easily over-supplied. October and the cool months are best for town markets. Fat pigs in the country sell well at, and immediately after. harvest, also at hoeing time. Pigs, like other farm animals, should always have access to water, also to a lump of rock salt. Bear in mind that pigs have no wool, and if well bred very little hair; therefore they require warmth, if you desire to economize food and produce fat. As sows are very apt to overlie their young this is easily prevented by a ledge or board, of about eight inches wide, projecting from the wall of the piggery, six to seven inches from the floor. The little pigs are safe from pressure under this edge.—J. J. Mechi, May 27.

"TURPENTINE v. THE TURNIP FLY."

From Bell's Messenger, May 29, 1871.

TO THE EDITOR OF BELL'S WEEKLY MESSENGER.

Sir—A friend of mine in this neighbourhood has, for some few years past been in the habit of moistening his turnip seed with turpentine (in the same manner as seed wheat is prepared to prevent smut) the night before sowing, as an antidote to the turnip fly—more properly, the *turnip beetle* (*Haltica Nemorum*), with so much success, that he assures me that his turnip crops have since been exempt from the attacks of this voracious little insect, while on one or two occasions, the crops of his immediate neighbors —whose seed had not been so prepared—were more or less eaten up by them.

I have mentioned the fact to several agricultural friends, and they all seem afraid to try the experiment, lest the turpentine should injure or kill the seed; so, *to insure confidence*, I have been trying a series of experiments in order to find out how much soaking the seed will bear without injury.

I obtained seed of the ordinary white stone, green globe, and swede, and also of rape, and procured some of the best wood (not *mineral*) turpentine, weighed out the seed in one ounce samples, and commenced by putting a sample of each into a small jar, and pouring turpentine over it, *to complete immersion*, at ten p. m. on the 9th of of this month; tied the jars down with prepared paper, to prevent evaporation, and proceeded in like manner with a sample of the four varieties of seed each night until the 15th inst., when I prepared additional samples by *merely moistening* the seed with turpentine and allowing the jars to remain uncovered during the night, in order to allow the turpentine to pass off by evaporation. On the following morning (May 16th) I took them all out of soak, dried them in the forenoon (by spreading and exposing each sample on a sheet of paper to the action of the atmosphere), and sowed them in the afternoon, together with a sample of each seed in its natural state (unaffected by turpentine) in separate rows, carefully labelled, and on a plot of ground prepared in the usual way for turnips, with farmyard manure.

On carefully examining the experimental plot this morning (May 23), I found each sample in a forward state of vegetation, having roots from half an inch to one inch in length, and the cotyledon leaves just beginning to show themselves above ground, and looking exceedingly healthy, without any appreciable difference in the forward state of any of the 36 samples sown; (if any, the plants of the seed that had been in soak for a week were slightly in advance of the rest). The plot of ground was not watered when the seed was sown, or since, with the exception of a slight shower of rain, (scarcely worth mentioning).

Hence it is evident that turnip seed will bear a week's soaking in turpentine, if necessary, without being injured thereby; and as a pint of turpentine is sufficient to moisten several pounds of seed, and the operation is simple and comparatively inexpensive, I think it is well worth a trial.

The turnip beetle I refer to is thus described in "Wilson's Farmer's Dictionary":—"The insect is about one-eighth of an inch in length. It is smooth and shining, and of a brassy black colour, with a slight tinge of green, particularly on the wing cases, each of which has a pale yellow or slightly sulphur coloured stripe running along the middle, curved inwards posteriorly and not reaching quite to the extremity. Such is the voracity of this beetle, that it has been observed, when shut up for the special examination of its habits, to consume no fewer than ten plants every day. The favourite food of the beetle, is the young turnip plant, just as it is beginning to unfold the cotyledon leaves." When the plants have acquired some degree of strength and the foliage is considerably developed, the injury done is usually insignificant, as the partial consumption of the leaves does not interfere so materially with their functions, as to have the effect of diminishing the size of the bulb. It has been said that the manure which most effectually promotes the growth of the plant will be the best defence from the insect; and that when the growth is slowest, the danger from the insect is most serious A gleam of sunshine is almost sufficient to call them into active life; but it requires the accumulated rays of the sun, and a much longer duration of warmth, to set in action the fluids of plants. It is the opinion of a great many agriculturists that raw and long manure harbours the beetle, and if turnips be sown on a stubble crop they are often completely destroyed. Whether this arises from the hollow straws forming a retreat for the beetles, or that the weeds had supported them, or the maggots, so that the chrysalides were lying undisturbed in the land, is not easily explained.

It has been recommended that no less than three or four pounds of seed should be drilled to the acre, and six or seven pounds broadcast, as thick sowing causes the plants to grow much more rapidly when young than thin sowing; and the surest way to obtain a strong crop is to sow seed of the same age, otherwise the plants do not come up simultaneously, and the beetle will attack and destroy the crop in detail. It is also recommended to drill in with the seed, a compost containing the strongest animal manures—ammonia in short—as guano, etc., the properties of which are not only distasteful to insect life, but force the young plants forward so as to defy their attacks.

The artificial watering of the young turnip crops every other day—4, 5, or 6 times if necessary—has also been recommended as an antidote, but to pursue such a course on our wold farms, where every drop of water is precious, and many of the turnip fields 30 or 40 acres in extent, would be no joke!

In Hanover, fields of white turnips have been preserved from the fly by thickly sprinkling the dust of chalky roads on the young plants at night, when a heavy dew is falling until they appeared covered with the powder. The fly, it is said, will at once disappear, especially if the next day be a bright sunshine, and the dust is dried upon the leaves, which prevents their little teeth from gnawing the leaf, or disgusts them in some other way, and they depart to more agreeable quarters.

An agricultural friend of mine on the Yorkshire wolds has applied powdered lime in a similar manner, and with marked success.

It is said by some that farmers are the greatest grumblers in existence! and wonder why it should be so; but if such would consider how they are often plagued with insect blights, etc., and their crops sometimes eaten up before their very eyes, while the merchant has his goods safely stored in a warehouse, and well insured perhaps, the wonder ceases. At any rate I hope that ere long, means will be discovered for putting a more effectual stop to the ravages of the turnip beetle, which, though minute in itself, is by no means the least plague to a farmer's crop. I remain, dear sir, your's obediently,

H. S. HARLAND.

Brompton, York, May 23, 1871.

NOTICES AND DONATIONS.

Annals of the Lyceum of Natural History of New York. Vol. 9, No. 13.

Thornton's Circular. A record of Short Horn Transactions. Vol 2, No. 12, April, 1871. John Thornton, No. 15 Langham place, London, W., England.

Bulletin of the National Association of Wool Manufacturers. Vol. 2, No. 4. Boston, Mass.

Memoirs of the Boston Society of Natural History. On the earthquakes of New England, 1639–1869, by William T. Bringham, A. M., A. A. S.

Monthly Reports of the Department of Agriculture, for March, April, May and June, 1871.

Fourteenth Annual Report of the Wilmington Institute, 1871. Wilmington, Delaware.

Premium List of the Annual Exhibition of the Queens County Agricultural Society to be held near Mineola, L. I., September 27, 28 and 29, 1871.

Proceedings of the Boston Society of Natural History. Vol. XIII, pages 369 to 435

Premium List of the Annual Fair of the Otsego County Agricultural Society to be held in Cooperstown, September 12, 13 and 14, 1871.

General Catalogue of seeds and plants of Vilmorin. Andrieux & Co.. 4 Quai de la Mégisserie, Paris.

Premium List of the Annual Fair of the California State Agricultural Society, to be held at the city of Sacramento, September 18, 19, 20, 21, 22 and 23, 1871.

Ten copies of the Report of the Secretary of the Iowa State Agricultural Society for the year 1870 ; also annexed, the Report of the Secretary of the Horticultural Society.

How to hire and how to let a farm. By J. J. Mechi. May, 1871.

Report of the Commissioner of Agriculture and Public Work for the Province of Ontario, on Agriculture and Arts, for the year 1870. Toronto.

Report of the Commissioners of Public Works for the Province of Ontario, for the year 1869.

Eighth Annual Report of the Trustees of the Massachusetts Agricultural College, January, 1871.

The External and Internal Parasites of Man and Domestic Animals. By A. E. Verrill, Prof. of Zoology in Yale College. 6 copies from T. S. Gold, West Cornwall, Ct.

Fifty-third Annual Report of the Trustees of the State Library.

List of Premiums of the Annual Exhibition of the Orleans County Agricultural Society to be held at Albion, September 15 and 16, 1871.

Smithsonian Contributions to Knowledge. Vol. 17. Washington, D. C.

Steiger's Literary Monthly Report (German). 2d vol. May 1870, to April, 1871.

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From the Royal Bavarian Academy of Sciences in Munich. Report of the Sessions of the Royal Bavarian Academy of Sciences in Munich. Vol. 2, Nos. 1, 2 and 3, 1870 ; also Memorial of Christ. Erich Herman von Meyer, by Carl Alfred Zittel.

Publications of the Society for the Promotion of Physical Science in Vienna. Vols. 9 and 10, 1868–69, and 1869–70. From the Society.

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From the Kongelide Danske Videuskabernes Selskabs Kjobenhaven. Oversigt over det Kongelige Danske Videuskabernes Selskabs. No. 2 (March, April, May and June). 1870.

Premium list of the 18th Exhibition of the Wisconsin State Agricultural Society, to be held at Milwaukee, September 25, 26, 27, 28, and 29, 1870.

Premium List of the Nineteenth Indiana State Fair, to be held at Indianapolis, October 2d to 7th, 1871.

Report of the Ballarat and Pastoral Society. Learmonth, Victoria, Australia, 1871.

Annals of the Lyceum of Natural History of New York. Nos. 1 to 3 (February and March), 1871.

From J. B. Lawes. Scientific Agriculture, with a view to profit, by J. B. Lawes, F. R. S., F. C. S. Reports of Experiments on the Influence of Various Manures on Different Species of Plants, by Dr. M. T. Masters and Dr. J. H. Gilbert. Exhaustion of the soil in Relation to Landlord's Covenants and the Valuation of Unexhausted Improvements, by J. B. Lawes, and Effects of the Drought of 1870 on some of the Experimental crops of Rothamsted, by J. B. Lawes and J. H. Gilbert.

Premium List of the Alabama Agricultural and Mechanical Association for the Fair of 1871, to be held at Montgomery, October 16 to 20.

Premium List of the Twenty-second Annual Fair of the Ohio State Board of Agriculture, to be held in Springfield, September 25, 26. 27, 28 and 29, 1871.

Premium List of the Thirteenth Annual Fair of the Minnesota State Agricultural Society, to be held in St. Paul, September 26, 27, 28 and 29, 1871.

A section of one of the knees of the Flag Ship Congress, commanded and sunk by Benedict Arnold, near the mouth of Otter creek on Lake Champlain, October 13, 1776, during our first naval engagement with Great Britain, raised after being under water eighty-four years, and presented to the New York State Agricultural Society, by S. C. Boughton, Waterford, N. Y.

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THE JOURNAL

OF

The New-York State Agricultural Society.

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New-York State Agricultural Society.

EXECUTIVE MEETING.

ALBANY, *July* 11, 1871.

Present—The President, Vice-Presidents Faile, Thorne, Winne and Geddes; the Corresponding Secretary, and Messrs. Ingalsbe, Lewis, Juliand and Cole, of the Executive Committee.

Letters and excuses for non-attendance were received from Vice-Presidents Curtis and Huntley, the Recording Secretary, the Treasurer, Messrs. Thayer, Swan and Brown, of the Executive Committee, and from Ex-Presidents Patrick, Faile and Campbell.

The resignation of Mr. Fordham Morris, as a member of the Executive Committee, on account of intended absence in Europe, was received and accepted.

On motion of Vice-President Geddes, Mr. James W. Wadsworth, of Livingston, was elected to fill the vacancy caused by the resignation of Mr. Morris.

Mr. Brown declining to serve as officer in charge of the Horse department, Mr. Wadsworth was, on motion, appointed to that department.

A communication was received from Professor Alexander W. Stein, M. D., secretary of the faculty of the New York college of veterinary surgeons, notifying the Executive Committee that the faculty had resolved to place a free scholarship in that college at the disposal of each State Agricultural Society, and on motion the offer was accepted, and the nomination to such scholarship referred to the President and Secretary.

The committee then proceeded to the selection of judges and appointment of superintendents for the approaching Fair.

THIRTY-FIRST ANNUAL FAIR.

Albany, October 2, 3, 4, 5, 6, 1871.

PROGRAMME.

Monday, October 2, preparation and arrangement.

Tuesday. October, 3, judges' day. In all classes except fruits and flowers, the judges will begin work at 10 A. M. In Class VI, fruits and flowers, at 12 M.

Wednesday, October 4, and days following, exhibition days, the horses will be out for exhibition, by classes, from 10.30 A. M. to 12 M., and from 2 to 4 P. M. each day.

OFFICERS IN CHARGE OF DEPARTMENTS.

Cattle—Mr. Swan.
Horses—Mr. Wadsworth.
Sheep and Swine—Mr. Juliand.
Poultry—Mr. Curtis.
Implements and Machinery—Mr. Geddes.
Grain and Vegetables—Mr. Ingalsbe.
Dairy, &c.—Mr. Lewis.
Domestic—Mr. Cole.
Fruits and Flowers—Mr. Angel.

JUDGES.

Short Horns—Thomas Bell, Eatontown, New Jersey; Samuel Thorne, New York.

Devons and Herefords—R. H. Van Rensselaer, Morris; Tobias Bouck, Schoharie.

Ayrshires—C. T. Hulburd, Brasher Falls; E. P. Prentice, Albany.

Jerseys—John Haven, New York; C. I. Hayes, Unadilla.

Grades, etc.—James H. Graham, Delhi; Silas D. Smith, Mechanicsville.

Horses, Breeding Stock—C. C. Bradley, jr., Syracuse; P. C. Kellogg, New York.

Work Horses—A. B. Raymond, New York; E. N. Thomas, Rose.

Fat Sheep and Long Wools—John Purves, Madrid; John Banks, Bainbridge.

Downs—R. H. Avery, Canastota; Alexander Mable, Delhi.

Merinos—Elon Percy, Hoosick Falls; William M. Holmes, Greenwich.

Swine—David Van Allen, Adamsville; John G. Hall, Argyle.

Poultry—Isaac Van Winkle, Greenville, N. J.; Geo. Tweddle, Albany.

Machinery and Implements—D. M. Greene, Troy; A. A. Sweet, Syracuse; W. Anson Wood, Hoosick Falls; D. W. Tuthill, Albany; John M. Williams, Salem.

Stoves, etc.—J. S. Cooley, Canandaigua; Lyman Benedict, Hoosick Falls.

Grain and Vegetables—C. B. Way, Camillus; R. W. Pratt, Fort Edward.

Dairy, etc.—T. D. Curtis, Utica; James H. Ives, Salisbury.

Wines, etc.—L. F. Allen, Buffalo.

Domestic—H. G. Dickerson, Lyons; Jas. W. Mairs, Schenectady; Edward Harper, Harpersville.

Fruits and Flowers—Charles Downing, Newburgh; F. R. Elliott, Cleveland, Ohio.

THE NEW YORK COLLEGE OF VETERINARY SURGEONS.

One of our greatest needs in this country, to be felt more and more sorely as our farm stock becomes better and more valuable, is that of competent veterinarians, True, well educated and able men have, from time to time, come over from the schools of Great Britain and the Continent, but their numbers have been few, and they have usually remained in our large cities where opportunities for extended and remunerative practice are to be had. In the country districts, however, the darkness of ignorance and the worse delusive lights of empiricism have covered the fair field, and multitudes of our dumb animals annually perish or become useless for want of veterinary aid. Some, indeed, are worse than neglected, tortured by presumptuous quacks, who not only mistake one disorder for another, but pretend to treat maladies that have no existence; and happy are the few for whom some benevolent physician takes the trouble to prescribe.

Seeing this state of things it was but natural that some of the best veterinarians in the city of New York, supported in their good work by a few of the more intelligent and public spirited of her citizens, should have associated themselves to found the first veterinary school in the United States A charter was obtained as early as 1857, but for want of means the college was not opened until 1864. It now occupies commodious and spacious premises at No. 205 Lexington avenue, and has its stables, infirmary, museum, lecture theatre and dissecting rooms, with the following list of professors, viz: J. Busteed, M. D., V. S., president; A. Liautard, M. D., V. S. (comparative anatomy and operative surgery); A. Large, M. D., M. R. C. V. S. L. (theory and practice of veterinary medicine); F. D. Weisse, M. D. (surgical pathology); Alexander W. Stein, M. D. (secretary and professor of histology and comparative physiology); Samuel R. Percy, M. D. (chemistry, materia medica and therapeutics), and J. L. Robinson, M. D., V. S. (adjunct professor of surgery). The regular lecture course extends from the middle of October until the end of February, but clinical instruction continues through the year, and the infirmary is always open. The fees are fixed at the moderate sum of $135 including diploma.*

During the six years the college has been in working order, it has graduated but a moderate number of young men, and it is with the view of extending the benefits of the institution and of making it better known that the faculty have resolved, as mentioned in the proceedings of the Executive Committee in this Journal, to place a free scholarship at the nomination of each State Agricultural Society in the United States. The requirements for graduation are, that the student be twenty-one years of age and of good moral character, and have attended two full courses of lectures and passed an examination in each of the departments of instruction. Few more useful and honorable pursuits are open to intelligent young men than that of the veterinary practitioner. No county in our older States but needs and will well support at least one of the profession, if faithful and competent, and the time must surely come when veterinary science shall take its true position in public esteem and its followers be duly honored and rewarded. This Society hopes to be able to nominate a meritorious candidate for the scholarship placed at its disposal, and applicants for the nomination should apply immediately to the Secretary.

* Those desiring further particulars may address Alexander W. Stein, M. D., 28 West Fifteenth street, N. Y.

PARASITIC DISEASE OF THE LUNGS AND LOWER AIR PASSAGES IN ANIMALS,—"VERMINOUS BRONCHITIS," "HOOSE," "HUSK," "GAPES."

BY JAMES LAW, M. R. V. C., CONSULTING VETERINARIAN TO THE SOCIETY.

A disease caused by the presence of round worms in the windpipe, bronchial tubes and lungs, is common to many animals and even reptiles. Man, himself, suffers, though luckily on rare occasions and in circumscribed localities (Trentler, Rainey, Bristowe, Paterson), nor do even marine mammals escape, the porpoise and narwhale having each their pulmonary parasites (Siebold, Kuhn, Quekett, Cobbold, &c.) It would seem, however, that it is among herbivore and birds that the malady most frequently attains an extensive prevalence, or a dangerous character.

History of the disease in the domestic animals.—This affection appears to have been first noticed by Daubenton, in 1768, as having caused a great mortality among sheep in the neighbourhood of Montbard (Instructions sur les bergers, p. 269). Next, Camper notices, at length, an extensive outbreak in calves in Holland, in 1778. In 1795 and 1811, both warm and wet seasons, it is reported as prevailing in Switzerland among calves of four or five months old (Despallens in Compt Rendu de l'Ecole de Lyon). In 1797, Dr. Wiesenthal, professor of anatomy, Baltimore, described *the gapes* among gallinaceous poultry, and furnished a description of the female parasite

Since that time it has been observed and reported, too frequently for full notice here, among others by Waldinger, Peterka, Bürgermeister, Thär, Ribbe, Haubner, Huers, Monteton, Gurlt, Hering, Rudolphi, Brem-

ser, Mehlis, Nordman, Diesing, Van-Beneden, Küchenmeister, Leuckart, Siebold and Röll, in Germany; by Michiels, Fischer, Reynders and Janne, in Belgium; by Gohier, Chabert, Vigney, Delafond, Chaussat, Colin, Dujardni, Davaine, Bouley and Reynal, in France; by Ercolain and Alessandiini, in Italy; and by Bellingham, Sandie, Padley, Read, Radcliffe Hall, Ranke, Crisp and Cobbold, in the British Isles. Indeed, of late, the disease has become so common among lambs and calves, in the middle and southern counties of England, that on many farms its recurrence is looked for as is the return of the seasons.

The gapes having been first described in America, has since received its due meed of attention among us; but excepting in the excellent monograph of Professor Verill, on "the parasites of man and domestic animals," I do not find the "verminous bronchitis" of calves and lambs so much as referred to in American literature I have been able to find no proof of the existence of this disease among our sheep, and the only evidence of its existence in calves is derived from the particulars of three outbreaks in different parts of New York, and about which I was consulted.

The first of these took place in the autumn of 1869, among the calves of Mr. Wood, Woodville, N. Y., and though one or two had already died, the malady was easily controlled by putting in practice the measures advised in this paper.

The second outbreak, which was only reported to me recently, occurred on the farm of Mr. Sutton, Ovid, Seneca county, N. Y. In this case four yearlings, fed during the previous autumn on a sloping dry orchard, and watered from a stream in a ravine close by, were attacked in March, 1870, while confined to the yards and fed on clover hay, with water from the stream. Two died in from six to ten days after the seizure, a third remained in low condition and perished in July, and the fourth recovered. On this same farm the chickens and turkeys perished in great numbers last summer from *the gapes*, and squirrels have furnished specimens of bronchial parasites.

The third outbreak took place in July last, on the farm of Mr. S. P. Swift, Cuba, Allegany county, N. Y. Nineteen calves were attacked, eleven of which had died at the time of my visit, and all the cows on the farm coughed and looked badly. The cows with which the malady probably originated, grazed on a partially cleared field full of stumps and brush, and abounding in springs and marshy places. They were driven home to milk along a road between the fields occupied by the two lots of calves, and could easily interchange courtesies with them over the fences. Seventeen of the calves kept in one field got water from a deep enclosed well in the centre of the field, while the remaining two never had water, but only milk. The calves lived on an average from nine to fifteen days after they were attacked. The treatment, as recommended, thoroughly destroyed the adult worms, as I failed to find one in the bronchial ramifications of a calf examined and which had been but twice fumigated, while in those that died before the treatment I had prescribed had been put in practice an abundance of worms were found. The yearlings on the same farm, kept on a separate field and without any means of communication with the cows or calves, escaped the disease.

An incident which occurred while one of Mr. Swift's calves was being skinned, throws some doubt on the fatality being due to the worms alone. A cat which licked some of the blood died on the spot, and before the skin was separated from the body; the body of this calf—the only one skinned—is further said to have appeared much infiltrated with black blood, which points to *bloody murrain—charbon*—as the immediate cause of death in this case at least. A cow, too, had suffered some time previously from an equivocal swelling on the jaw, which burst and discharged an unhealthy sanious liquid.

This complaint is probably much more frequent in calves in this country than has been yet recognized, and with our constant importations of English long woolled sheep it will be a marvel if we fail to import their pulmonary parasite.

In describing the disease it will be convenient to consider it under different heads, grouping together those animals which harbor the same species of worm.

Verminous bronchitis in the ox, horse, ass and mule.—The same parasite attacks one and all of these animals. This is the *strongylus micrurus* of Mehlis, a small thread-like worm, the male one and a half inches long, the female three inches. The head is rounded, with no constriction or neck, the mouth furnished with three chitinous papillæ, the œsophagus club-shaped, the genital orifice of the *female* situated in the anterior half of the body, and the tail pointed; the male has a caudal pouch with five rays standing well apart. They were noticed by Camper to be viviparous, but this must be qualified by the statement that the female after becoming imbedded in the lung substance, or after being expelled by coughing, perishes often with its oviducts still full of ova, and these gradually hatch out amidst the decomposing debris of the parent.

Development.—The development of the parasites has to be considered as it takes place *in* and *out* of the body. *Within the body* in the earlier stages of their life—that of ova and embryos—the parasites are found embedded in the substance of the lung tissue mostly toward the margins of the lobules, where they may live for indefinite but often long periods. Baillet killed a lamb thirty-two days after he had administered the embryos of a strongylus filaria taken from the oviducts of a female worm, and found the parasites rolled up into pellets in minute semivitreous nodules in the posterior part of the lungs, and varying in length from one-third to a line. It is probable, therefore, that these lung-infesting strongyli may live for many months encysted in the pulmonary tissue in this imperfect condition. The appearance of the lung so affected is redder than natural, and its surface feels rough and uneven by reason of the numerous minute exudations around the embryo worms. These nodules, which were long mistaken for miliary tubercles, vary in size from that of a pin's head to that of a barley corn, while at certain points many will become accumulated so as to cause uniform consolidation of lung tissue to a considerable extent. They vary, too, in consistency from a simple semifluid mass to a hard calcareous shell. The soft and semitransparent spherical nodules contain the younger worms, often microscopic, and without sexual development, while the larger and dark colored cysts contain worms of nearly their full size, and furnished with sexual organs. Some of the larger cysts are not spherical, but irregular in outline, and these, on being opened, are found to contain the debris of the parent worm with numerous ova and microscopic embryos, mixed up with an abundance of pus cells, granular masses and granules. At times, more or less of the worms approaching maturity may be seen making their

way through the mucous membrane from the pulmonary cysts to the bronchial tubes.

The second stage of their existence, and that in which they are most injurious to their hosts, is that of the sexually mature parasite in the bronchial tubes. They may be found at all points from the throat down the windpipe and through the smallest ramifications of the air tubes, either singly imbedded in the frothy mucous, or in large numbers rolled into pellets, and it may be. completely obstructing the bronchial tubes. The mucous membrane of these tubes is reddened, softened and inflamed, and the smaller tubes that have harbored the worms for some time are usually dilated much beyond their natural size. Many thousands of these worms often exist in the lungs of a single animal, and as one worm will produce its thousands of eggs, capable of contaminating a large herd, their presence in any particular stock ought not to be lightly passed over.

Colin, who has investigated this subject very thoroughly, says: "The strongyli of the calf remain in the vesicular tumors a much shorter time than those of the sheep. They are encysted and quiescent but for a short period and spend most of their life in the bronchia, where they accumulate in masses which intercept the passage of air through many of these tubes and produce an intense dyspnœa, or even slow but a fatal asphyxia, the lung tissue meanwhile retaining marked traces of the passage of the parasite. There are cases where the bronchia in the lungs of the calf are so invaded that the lobules furthest from the larger bronchial tubes are denied the entrance of air. The strongyli accumulate in hundreds in inextricable pellets which the air cannot traverse. Thus these lobules appear to be hepatized."

"The strongyli fill the bronchia of the calves' lungs during the first year, but they do not long obstruct them; they die and are eliminated at the end of a season."

"This is the mode of reproduction of these worms: The females, twice as large as the males, have a long resistant oviduct, sinuous and folded upon itself, containing, from its depth to its terminal orifice, eggs in all phases of incubation. At first they are scarcely recognizable; afterwards are others of which the yolk is divided into 2, 4, 8 or 16 spheres, and whose surfaces are irregular, like that of a raspberry; further on, the eggs contain a curved immovable embryo; at last an embryo in the form of the figure 8, in a loop, or in a spiral, like the trichina in its muscular cyst."

"It is not necessary that the female should remain alive in order to the laying of the eggs; even when she dies the expulsion of her progeny is assured. If she lays them in the bronchia, the young ones are developed or expelled. If her progeny must be preserved for a more propitious season, or for another age of the animal which harbors them, she encloses herself in a tubercle in one of the air sacs, afterwards dies and is transformed into a veritable bag of eggs, destined to furnish, insensibly and for a long period, the contingent which the living worm would have been able, in other circumstances, to render at one laying."

"The two habitats of these worms thus coincide each with one period of their life and with certain circumstances of their reproduction. In the cyst they hatch successively with a certain slowness, remain small, asexual, and live surrounded by the debris of their mother. Later, they develope in the bronchia, become sexual, adult, copulate, and prepare, it may be, for emigration externally, it may be for a new (*internal*) reproduction in the lungs, during which they constitute numerous reserves for all the period of the life of the mammifer, as is a possible case, not for the calf, but for the sheep."

Out of the body of their host the life of these worms in water is thus described by Colin: "After the death of the mother its body swells, its skin is torn off, and the oviducts float free, and masses of eggs and myriads of embryos escaping disperse themselves at the bottom of the water. I have watched for eight days in succession the continuance of this hatching, the little ones always showing the same vivacity alike in the clearer parts of the water and in the vicinity of the detritus from which they have sprung. Whilst a certain number died, there still remained a prodigious quantity, soon, however, becoming mingled with infusoria developed in the liquid."

"There are here two facts: the birth of the worms in the dead body of their mother, and the external life of the little ones, the cause and condition of the contagion. In effect, the animals of which the bronchia conceal the strongyli reject them under the influence of cough and the expectoration of mucus charged with worms, which fall on the food, the litter, upon the soil, or in the water drunk; the mothers die, but the eggs are hatched, and the living brood wait till they have the opportunity of entering the bodies of animals. It is, above all, in water that they are long preserved outside the animal economy. I have watched them in pools of fresh and stagnant water, the one destitute of vegetation, the other penetrated with confervæ or covered with lentiles, dead leaves, and divers debris. The adult worms died at the end of some days. From their carcases the oviducts escaped, carrying with them eggs in all stages of development. Incubation, already well advanced during life, is continued without interruption. The embryos are expelled from the shell and dispersed in the water during one, two, three, four, five or six weeks, according to the temperature and other conditions of the liquid. The development takes place more regularly in fresh water than in salt; in river than in spring water; in pools with lentiles and confervæ than in pools exposed and slimy. It was notably retarded but not suspended, in fetid water charged with carburetted and sulphuretted hydrogen. These worms are so tenacious of life that their evolution takes place in the customary manner, even in water in which portions of the infested lungs have been macerated. The septic element disengaged from these putrid fragments retarded the development of the strongyli, but failed to arrest it. And even if the experimental troughs contained a very large amount of water, the strongyli disengaged themselves in great numbers from the morsels of putrid lungs; and, though reduced to a putrid pulp, the eggs could be seen amidst this ready to open, and the young worms escaping from their envelopes."

"It is in fresh water that the worms are most readily developed, and live longest after leaving their natural habitat. Water is a transition medium in which the worm which has abandoned one animal can survive, waiting a favorable opportunity to enter another. In this medium the strongyli are hatched and live for entire weeks and months without perceptible growth, that is to say, they preserve their primary microscopic proportions. They can there resist sudden changes of temperature and the deleterious influence of putrid matters, whilst they wait an occasion of entering with the aliments into the body of a new host, in whose air passages

they find the conditions necessary to their assuming the attributes of sexuality and reproducing their kind."

Causes.—These are, of course, primarily and mainly the introduction into the system of the embryo strongyli, but many other conditions may combine as accessary to the preservation and propagation of the worms. Thus, *wet seasons*, by providing moisture or pools for the preservation of the embryos contribute to their wider diffusion. In keeping with this we find the first record of the disease as existing in the low wet grounds of Holland, and the two by Despallens as occurring in the wet summers of 1795 and 1811. The same holds good in England alike as regards the prevalence of the disease in the low fenny counties, and in rainy seasons; and these remarks apply to other animals as well as calves and lambs. A donkey, from the low meadows at Hammersmith, London, rarely failed to yield a supply of the strongyli. And in the present year, which has proved unusually cold and wet in the British Isles, we are not surprised at the serious complaints of the extraordinary death of pheasants from *gapes*. The cows on Mr. Swift's farm at Cuba, with which the disease probably originated, were pastured in a new field full of stumps and brush, and abounding in springs and marshy places. A *second accessory* is to be found in the *youth of the animals*, the weakness of which and the abundance of secretions from their mucous membranes predispose to this as to other parasitic affections. *Weakness* from ill health or old age may be classed along with this. But, perhaps, the most important of these accessory causes is feeding on *contaminated fields or fodder*, or drinking from *troughs or streams containing the worms*. In the affected counties of England calves and lambs are especially liable to suffer, if pastured on fields previously eaten down with older stock. Overstocking has also its evil influence, partly by reason of its weakening the constitution of the animals, and partly by causing an extraordinary accumulation of embryo strongyli in the pastures and drink.

Symptoms.—The symptoms are essentially those of bronchitis, with this difference: that the examination of the mucus coughed up shows the presence of the worms either solitarily or rolled together into bundles. The symptoms, however, vary a good deal in different cases. There is, at first, only a slight cough, rather hoarse and hacking, and repeated at irregular intervals. The coat stares, the skin feels dry, inelastic and unhealthy, and emaciation perceptibly advances day by day. Sometimes the cough is not observed at first, and these symptoms alone, or with some slight embarrassment of breathing when exercised, are the sole manifestations. Soon, however, the cough becomes more frequent and occurs in paroxysms which threaten suffocation, and sometimes induce it. The matters expelled by the nose and mouth are found, on examination, to contain more or less of the worms appearing like pieces of stout white thread, one to three inches long.

Often when the cough is less frequent, it is at the same time soft and loose, or even wheezing rather than hoarse; the patient becomes daily weaker and more hide-bound, the visible mucous membranes get pale, the eyes sunken, the appetite fails, the animal leaves its fellows and may be found in a corner of the pasturage or under a tree, its skin covered with vermin and flies, which it no longer has the vigor to brush off. The patient finally dies in a state of extreme weakness.

Worms in the bowels often form a serious complication, though one too much overlooked. From the presence of these arise indigestions, tympany (bloating), and above all, diarrhœa, which rapidly exhaust the strength and hasten death.

The parasites found in the intestines of oxen in such cases are chiefly: the Strongylus radiatus, in the small intestines, and the Tricocephalus affinis and occasionally the Sclerostoma hypostomum in the larger intestines. These are merely the common parasites of the ox, which increase in direct ratio with the debility and the improper condition of the aliments. The same holds good in the horse and ass. In similar conditions their small intestines contain the Ascaris megalocephala, and their large intestines the Sclerostoma equinum, the S. tetracanthum and the Oxyuris curvula. To describe these worms at length would unnecessarily extend this paper, and serve no good purpose.

Duration.—In ordinary cases, calves will live two or three months after being attacked, although the blocking up of the windpipe or principal bronchial tubes by pellets of worms, or the accumulation in the lungs of ova and embryos to the extent of causing a general inflammation, may at any time precipitate death. Mr. Swift's calves died at periods of from nine to fifteen days after they were noticed to be ill.

Verminous Bronchitis in Sheep, Goats, Camels and Dromedaries.—This differs from the last mainly in the variety of the *Strongylus* affecting the air passages, and the greater tendency to the complication of intestinal worms and diarrhœa. The parasite, infesting the lungs and air passages of the sheep and other animals mentioned, is the *Strongylus filaria.* This worm strongly resembles the *Strongylus micrurus* in the sizes of both sexes—the rounded head, the rounded mouth, with three papillæ, the club-shaped gullet, and the dilated stomach. The *female* differs mainly in having the genital orifice in the posterior in place of the anterior half of the body, and the *male* in having its caudal sac furnished with ten instead of five rays. As in the *Strongylus micrurus*, the oviduct of the female extends throughout nearly the entire length of the body, and when full, hides the whole digestive canal posterior to the gullet.

Their habits in the lungs and air passages are essentially the same as those of the *Strongylus micrurus*. They give rise to the same nodules in the lungs, and are found in similar pellets in the bronchial tubes. Regarding their existence out of the body, Baillet remarks:—"The young *Strongyli filariæ* at the moment of being hatched are possessed of a remarkable vitality. We have, several times, preserved the mothers in water or in humid air until they have attained a very advanced stage of putrefaction, and found in the midst of their debris the little ones still alive. At other times we have preserved the young *strongyli* in glass capsules, which we have placed among herbs in the midst of a vase of flowers, covered with a bell-shaped glass, and have retained them alive for two or three months." He goes on to add that though alive and active, growth was suspended. Ercolani dried the *Strongylus filaria* for thirty days, and on moistening them at the end of this time found signs of life remaining. On other occasions he immersed them in spirits of wine at 30°, and in a solution of alum and corrosive sublimate, without destroying life.

That the worm does not require to undergo an alternate generation in food or water, or in the body of some other animal before re-entering and reproducing itself in the sheep, is established by Baillet's experiment already referred to, in which the oviduct of a worm taken from a sheep was given to a lamb, and produced embryos in its lungs in less than thirty days. In a second lamb killed on the twelfth day after taking the ova, the surface of the lung presented small patches of a deep red, but in which he failed to find the worm. The same conclusion might be safely arrived at from the well established fact that these parasites often exist in the lungs throughout the entire life of the sheep subsequent to the attack. So common are they in many parts of England, that it may be said to be the rule to find them present in the lungs of sheep examined in

the butchers' shops. No age is found to be exempt, though it is no longer fatal in strong adult sheep well cared for; hence the saying of Dr. Radcliffe Hall, that "the pulmonic affection does not prevent the sheep from furnishing excellent mutton." As in the case of cattle, it is fatal to the young only, the yearly losses of which in infested localities are enormous, unless the greatest care is taken in their treatment.

Lambs attacked with diarrhœa, while suffering from this disease, harbor larger numbers of the Strongylus filicollis, the Strongylus contortus, and the Tænia expansa in the stomach and small intestines, and not unfrequently the Sclerostoma hypostomum, and Tricocephalus affinis in the large intestines.

The symptoms and the conditions favoring an extensive diffusion of the malady do not materially differ from those enumerated in speaking of the calf. Intestinal worms and diarrhœa are more constant accompaniments, and hasten death by the resulting weakness and by favoring the breeding of maggots about the thighs.

Verminous Bronchitis in Pigs.—The Strongylus paradoxus appears to have been first found by Ebel in the lungs of a wild boar, in Prussia, afterwards by Modeer in the bronchia of a pig in Sweden, and subsequently among others by Rayer, Bellingham, Mehlis, Bremser, Hering, Chaussat, Alessandrini, Dujardin, Baillet, etc. Chaussat and Alessandrini found them abundantly in the pigs killed in the public slaughter-houses of Paris and Bologna, respectively, and concluded that they were innoccuous. Deguillême, on the other hand, has seen a three months' pig die suffocated by the accumulation of these worms in the bronchia. It seems probable, therefore, that when they gain access to the systems of young pigs, they are no less hurtful than are the allied species in calves and lambs.

The *Strongylus paradoxus* is easily distinguished from the Strongylus filaria and Strongylus micrurus. The body, usually brownish, has a conical pointed head, with a small round terminal mouth, and a short œsophagus slightly dilated posteriorly. The *male*, eight or nine lines in length, has two caudal pouches placed opposite to each other, and furnished with five rays, and is provided with a curved spiculum. The *female*, about one and a half inches long, has its tail terminating in a sharp point, and its genital orifice in the anterior half of the body between the second and third fifths; viviparous.

Prevention.—Two indications present themselves as calculated to prevent this disease:—1st. To prevent the worms from gaining access to the system; and 2d. To bring the animal into a condition unfavorable to the development and destructive work of the worms.

Under the first head might be mentioned many specific precautions: 1st. In localities where the parasite is known to exist, *lambs or calves should not be depastured on land recently occupied by sheep or by older cattle or horses.* Lambs may be safely grazed after horses or cattle, or foals and calves after sheep, but no young animal in such place should be allowed to graze after any creature liable to harbor the specific parasite, to whose attack its lungs are obnoxious. 2d. *Overstocking should be avoided.* If the parasite is introduced on any pasture, the facilities for its increase will be in exact proportion to the number of animals present in whose lungs it can attain full sexual development and reproduce its kind. 3d. *Thorough drainage will go far to prevent it.* As the young worms must live in water or in moist earth, the facilities for their preservation will be increased according to the springy or marshy nature of the soil. 4th. *Young stock must not be allowed access to water coming from a field containing beasts infested with its own pulmonary parasite.* 5th. *Pastures or water in which any particular pulmonary parasite has gained a footing, should be denied to all animals known to harbor that particular parasite, or still better, the soil may be torn up with the plough and subjected to a rotation of other crops until time has been allowed for the destruction of the germs.* 6th. *No affected or suspected animal should be placed with others, nor in their pastures, until time has been allowed and measures taken to rid it of the unwelcome visitant.* 7th. *Feeding young animals on grass wet with dew, or on clover or other such fodder as affords by its abundant moisture a suitable nidus for the young worm, is to be avoided.* 8th. *Carcases of those dieing of the affection should be deeply buried.*

The testimony of English farmers is strongly against second crop grass, and above all, clover which has been fed off with sheep or beef cattle, as the case may be, in the spring; and that eminent Prussian breeder, Baron Von Nathunsius, Hundisburg, Magdeburg, asserts that though the *filaria* in lambs was formerly very frequent and pernicious in his neighborhood, he has not observed it for twenty years, since they took to feeding the lambs in sheds, on hay and roots during the wet season

Under the second head, that of enabling the animal to resist the worms and their effects, may be mentioned, 1st. *The importance of good feeding*; and, 2d. *The value of a free supply of salt.* Most English flock-masters speak of the necessity of keeping the lambs in good condition, partly with the view of enabling them to prevent the worms from effecting a lodgment in their bodies, but mainly to enable them to survive the depressing effects attendant on the presence of the parasite. One man finds that the fatality of the disease diminishes very materially where his lambs are fed roots; another lauds oil-cake as being nearly a preventive, and a third saves most of his lambs by feeding well after weaning. The disease is found to be quite as prevalent in wet seasons as in dry ones, if not more so, but the mortality always increases with the dryness, and the lack of nutrient food. The use of salt is based on the fact elucidated by Dr. Crisp and others, that contact with a solution of this agent is promptly fatal to the young worms.

Remedial Treatment.—This resolves itself into: 1st, *supporting the strength of the animal*; 2d, *destroying the intestinal and pulmonary parasites*; and 3d, *combating pneumonia or any other complication which may supervene.* Attention must, of course, be given to prevent the access of more parasites to the system by partaking of contaminated food, water, or mingling with diseased flocks or herds.

To support the strength, the patients must be liberally fed on oil-cake, rape-cake, roots, corn, oats, beans or other sound nutritious diet, to which may be added a mixture, in equal parts, of powdered sulphate of iron, gentian and ginger in the proportion of four ounces of the mixture to every ten calves, daily—lambs may take two ounces to the same number, daily, at three months old.

To destroy the intestinal parasites, common table salt may be given to lambs in doses of a teaspoonful every other morning, dissolved in water, and to calves in doses of three teaspoonfuls. Oil of turpentine is, perhaps, more efficient, and may be given to strong three months lambs in doses of two teaspoonfuls, or to calves of the same age in doses of a tablespoonful, well shaken up in milk. These doses should be given in the morning fasting, and repeated the third day.

To dispose of the lung parasites is a more difficult matter, not because the worm is less easily killed, but because the young worms and, above all, the ova encysted in the substance of the lungs cannot be reached. The worms living free in the windpipe and bronchia may be readily destroyed, by causing the affected animal to inhale sulphurous acid or chlorine gas. The agent first named is preferable as being less irritating than chlorine, as exercising, indeed, when sufficiently

diluted in air, a soothing and antiphlogistic action on the inflamed bronchial mucous membrane. It is best administered by burning flowers of sulphur in a close house, but into which air can be readily and freely admitted in case of need, and in which both the patient and administrator are enclosed. It is commonly advised to throw sulphur on hot coals, but, as the latter give off carbonic acid and render the air unwholesome I have adopted the plan of twisting up a small piece of soft paper into a cone, putting into this a pinch of sulphur and burning it, holding, meanwhile, by the twisted point of the cone. The sulphur fumes ar toe be evolved in this way until the air of the apartment is impregnated as strongly as the administrator and his patient can bear without violent coughing. Breathing of the sulphur fumes should be kept up for half an hour or as long as the air of the building remains impregnated with it, and should be repeated at least three days in succession. At the end of a week, should the patient survive, the smoking should be repeated to destroy the parasites which have been hatched in the interval. The same process may have to be repeated once more, though if the ova in the lungs are so numerous as to endanger life after this, the inflammation caused by their presence will probably speedily cut off the patient.

Chlorine gas may be set free by mixing in a cup or saucer common salt, peroxide of manganese and sulphuric acid. It is equally efficient with sulphur smoke, but much more irritating and to be used with greater care. Indeed, this matter of smoking by either agent should only be trusted to the most careful and intelligent persons, otherwise serious accidents may ensue.

In the worst cases the accumulation of worms and ova in the lung tissue produces an extensive inflammation of these organs and renders all treatment unavailing. This has been treated by blistering, wine, &c. but rarely with any measure of success.

"*Gapes*" *in birds*.—This disease in birds is analogous to those just considered in quadrupeds. Many different genera of birds are subject to it, and the same worm infests the air passages in the turkey, domestic cock, pheasant, partridge, common duck, lapwing, black stork, magpie, hooded crow. green woodpecker, starling, and swift. This worm is known as the *Sclerostoma syngamus*, so called because the sexes are generally found inseparably joined in perpetual union or marriage. The *female* is five-eighths of an inch long, the head separated from the body by very marked constriction or neck; the mouth large, round and furnished with six prominent chitinous papillæ; the body has a semblance of being spirally twisted and shows a propensity to curl at the tail, which is in the form of a prolonged pointed cone; the genital orifice is situated at about one-seventh inch from the head, and to this the male is inseparably united by its caudal extremity. The *male* is one-eighth inch long, with broad head situated obliquely; the tail is obliquely terminated with a membranous sac at one side, supported by twelve or fifteen rays, and affording the means of attachment to the anterior border of the genital orifice of the female.

The description of the disease written by Dr. Wiesenthal, of Baltimore, in 1797, may be adopted in the present day. "There is a disease prevalent among gallinaceous poultry in this country called the *gapes*, which destroys eight-tenths of our fowls in many parts, and takes place in the greatest degree among the young turkeys and chickens bred upon old established farms. Chicks and poults, in a few days after they are hatched, are found frequently to open their mouths wide and gasp for breath, at the same time frequently sneezing and attempting to swallow. At first the affection is slight, but gradually becomes more and more oppressive, and it ultimately destroys. Very few recover; they languish, grow dispirited, droop and die. It is generally known that these symptoms are occasioned by worms in the trachea. I have seen the whole (windpipe) completely filled with these worms and have wondered at the animals being capable of respiration under the circumstances."

It will thus be seen to prevail in the young and weak, and on runs long occupied by the poultry. A damp soil, and poultry house. and want of cleanliness, may be added as powerful contributing causes.

Treatment.—The disease spr ads with great rapidity, so that a prompt separation of the diseased from the healthy is demanded. The removal of the sound birds to a dry yard, on ground not already overrun and contaminated by the diseased, and shutting them up from running among vegetables until the morning dew is off, will often succeed in checking the progress of the malady.

Various medicinal agents have been given with the view of destroying the worms. Thus, a piece of camphor as large as a pea has been thought effectual. Mr. Montague, having changed the place, gave an infusion of rue and garlic to drink. and hempseed, with the green vegetable of the grass plat in the menagerie yard, to eat, and had all his partridges speedily well. Dr. Wiesenthal long ago pointed out that the worms might be withdrawn from the windpipe by a feather divested of all its plumes except a few at the tip, which is then pushed down the trachea through its opening seen in the centre of the tongue, and, after having been turned round a few times. is withdrawn with the worms attached. Spencer Cobbold cut open the windpipe and picked out the worms with forceps, afterwards closing up the skin with stitches. But both of these operations too often give but temporary relief, as they can enable us to extract only those worms which are located in the windpipe. Those occupying the air-tubes in the lungs still survive, and too often kill the fowl at a later day. Hence. the necessity of medicating the feather by some agent destructive to the worms. Mr. Bartlett, of the Zoological Society's Gardens, London, advises a solution of salt or a weak infusion of tobacco; others use oil of turpentine, to which the standard solution of sulphurous acid may be preferred as being less dangerous. Fumigation with sulphur smoke. after the manner advised for the quadrupeds, may be resorted to, but with additional precautions, because of the greater susceptibility of the bird. Tonics are also demanded, and may be supplied by keeping rusty iron in the water drunk. or by mixing iron filings or the sparks from the blacksmith's anvil with the food.

In cases where the poultry house and run cannot be changed, the walls and floor of the house should be well washed with a solution of carbolic acid or common salt; and salt should be scattered freely and uniformily over all ground to which the birds have access.

NEW METHOD OF HORSE SHOEING.

From the *Farmer* of July 17th, 1871.

Meeting of the Central Medical Veterinary Society at Edinburgh, July 6, 1871.

The subject of the evening was the new method of shoeing horses, known as the Pre-plantar system, invented some time ago by M. Charlier, V. S., Paris. The president introduced M. Charlier. junr., who is at present residing in London, and interpreted to the meeting the substance of his (M. Charlier's) observations, as follows:—The foot of the colt, when in a perfectly natural state, and before it has ever been shod, presents a conformation beautifully adapted for the performance of those functions which by nature it is intended to fulfil; being strong to resist wear and tear, and to support superincumbent weight, as well as

yielding and elastic, to counteract the effects of concussion.

The principle upon which M. Charlier's mode of shoeing is based, is the application of iron (or any sufficiently hard metal. simple or compound), to that part only of the foot of the horse which requires to be protected from the excess of friction which any animal used for saddle or draught must be exposed to when going rapidly. either upon a paved or macadamized road, or indeed on hard ground of any kind.

The portion of the hoof subjected to such wear and tear being the lower or treading portion of the crust (that which comes in direct contact with the ground), Mr. Charlier's plan of acting simply is to protect this part from injurious friction, at the same time preserving in its integrity the natural form and structure, and consequently all the functions of the horse's foot. To this end the lower edge of the superficial crust (or wall) only is cut away, the portion removed being replaced by a metallic rim, necessarily more* resisting than the natural wall of the foot but precisely the same in form and thickness as the substance removed.

This metal edging or shoe lies imbedded in a groove, made by Charlier's drawing knife. an instrument constructed for the purpose by the inventor. something resembling an ordinary moulding plane, and which any shoeing smith can use. The shoe thus let, as it were, into the foot, becomes a continuation of the natural hoof to the tip of the toe, but not extending beyond it; and in a normal shaped foot at once (or in a weakly foot after about three months' duration of this plan of shoeing. and consequent free growth of horn), lies level with the sole and frog, both of which are thus permitted to come into direct contact with the ground.

The frog is never pared, and, being left entire, soon becomes thick and flexible, and assists to support the body, forming with its spongy upper cushion a medium of elasticity to weaken the shocks upon the tendons and the joints. Its structure, too. soon resembles india-rubber, and it thus constitutes in the hinder part of the foot a natural elastic wedge which expands. and keeps wide open the heel. The frog also, when well developed, fulfils another office besides strengthening the bearing upon the ground, for it prevents the horse from slipping, acting like the pad under the foot of the camel. dog or cat. This last function is of very great advantage by securing the safety of the rider, and is all important in the paved streets of towns, when turning sharply round a corner or in travelling over ice. With Charlier's shoe the sole of the foot is never touched, and the horn being permitted to remain in its normal state grows freely, and is always healthy and strong, for from bearing upon the ground it becomes hard and thick, and able to resist contact with the sharpest stones. Thus is obtained that real cover for the foot so desirable, a good sound sole.

All artificial means to prevent the contact of the sole with the ground have turned out to be injnrious, causing wasting, softening, and disease, more or less, of the sensitive portions of the foot. The frog and the sole, moreover, appear to be more abundantly secreted the more that they are exposed to attrition; and like the skin of the hand of the blacksmith, or the foot of the beggar boy who has never worn a shoe, get to be incredibly resisting, and capable of being exposed to very hard and rough usage.

Charlier's method will thus be seen to be directly opposed to the ordinary system of shoeing horses, as generally practised in Great Britain and in France; which system is, in his opinion, neither more nor less than a mutilation of the hoof of the horse by the knife and rasp, with the application to the extremity of the leg of the animal of an unnecessary weight of iron; oftentimes so constructed as to elevate the horse upon a kind of skate, making him to be like unto the ladies with monstrous heels, thus seriously injuring the action of the leg, and (as the ladies) causing to the wearer suffering and torture.

Many of the serious affections of the foot and heels of the horse, especially bad corns, are induced by the present mode of shoeing; a fashion which must be condemned alike by the teachings of science, the reasoning of common sense, and the result of daily observation and experience.

Once again, then, let it be repeated, that the frog and sole must have pressure or they will become useless and diseased. With the foot shod *a la* Charlier, the heels of the horse are kept open, and the bars strong, the frog prominent and flexible. and the soles as firm and thick as the unshod colt, for they are never touched by a knife. The great enemies to the introduction of this system will be ignorance and routine, but these the friends of progress must destroy by their authority, when the object to be gained is the preservation of such a precious thing as the horse.

As to the material of which this shoe is to be made, it should properly be half steel, half iron. Steel alone (although it may be used) is too brittle, whilst common iron is too soft for durability, the portion of metal necessary for the shoe being so very slight. Professor Ferguson, of this city, has had a composition bar of steel and iron so constructed that whilst all the toughness of the iron is retained, and fracture thereby obviated, the steel edge enables it to resist the friction of the road for five or six weeks, as long a time as it is desirable to leave the same shoe on. Finally, as to the objects to be gained: corns, contractions, narrow heels, and bruises of the sole, are prevented by the Charlier shoe; whilst brushing, speedy cut, and over-reach are got rid of, the weight of metal appended to the horse's foot being so slight as not to interfere with his natural action; whilst the shape and functions of the foot are left entirely as nature made them.

The principles of the system were thoroughly discussed, and the Fellows concurred in the belief that they are based generally upon a sound and perfect acquaintance with the natural conditions of the foot.

The debate, which was somewhat prolonged, was concluded by a cordial vote of thanks to M. Charlier, jun., for his attendance, and exhibition of numerous models after nature, as well as morbid specimens, which powerfully illustrate his system.

EXPERIMENTAL FARM AT ROTHAMSTED, HERTS.

On Tuesday, the 6th instant, a large party of Hampshire agriculturists inspected this interesting farm, by the invitation of Mr Lawes. As occupiers or agents, the gentlemen forming the party are interested in the cultivation of upwards of sixty thousand acres of land, and naturally enough feel a deep interest in an experimental farm having so great an influence on that most important branch of agriculture, the proper application of manures.

The experiments of Mr. Lawes on the effects of various manures on agricultural crops are unequalled for their variety and for the length of time during which they have been carried on, and for the scientific

and careful manner in which it has been attempted, with considerable success, to solve various questions connected with the growth of plants.

There is probably no locality, either here or on the Continent, where such a series of experiments have been carried on, for it requires, to conduct them successfully, such a variety of favourable circumstances as can hardly be combined in the same individual.

We require for them a practical knowledge of agriculture, a plentiful capital to carry out costly experiments and trials, which must entail great pecuniary sacrifices, and a constant supervision; and besides these it requires, what is much rarer, a scientific training, and a tact to apply that science to agriculture. With this must be added a perseverance to carry out one's views for a long series of years, for nature does not reveal her secret workings in one or two years; it requires almost a lifetime to learn the true bearings of such experiments, and to eliminate all causes of error. The ordinary agricultural experiments on one crop may be of some utility to an individual on his own farm, but such as those of Mr. Lawes are of true scientific and national value. In other countries such experiments are carried on at the expense of governments, and with a salaried staff of scientific men; but with us one individual, at his own expense, has equalled any of the results arrived at on the Continent, and by so doing has corrected the errors of some of the most eminent Continental chemists.

The Royal Agricultural *Journal* contains many of Mr. Lawes' very interesting articles on manures and feeding stuffs, and to these we must refer those taking an interest in the subject, and here simply give a short description of a most instructive and enjoyable day spent at Rothamsted.

On reaching Rothamsted, the party were met by Mr. Lawes, who kindly explained everything personally. They proceeded, after luncheon, in the first instance to the park, in which eighteen plots of grass, each half an acre, have been tried for the last sixteen years with the same manures, the experiments commencing in 1856.

The results are, that the unmanured land has averaged twenty-two and three-quarters hundredweight of hay per acre, that superphosphate of lime is almost useless on grass unless ammonia is supplied, that sulphate of potash, soda, etc., encourage the growth of clover but do not greatly increase the bulk of the crop, but that ammonia salts and nitrate of soda act most powerfully, and are the real manures for grass crops. Ammonia, however, destroys the clover and encourages the coarse grasses; the crop where the greatest quantity of ammonia was sown, producing nearly all cock's-foot grass. The ammoniacal salts produced an average of three tons of hay per acre.

A valuable discovery in connection with the application of nitrate of soda (also a great fertilizer of grass, from its rapidly supplying nitrogen) is, that by repeating heavy doses yearly, it washes into the soil and fertilises it to a great depth, so that the roots of the grass following the fertilizer get beyond the depth affected by drought, and produce a heavier crop in a dry season. Thus, in 1870, nitrates produced nearly three tons per acre, while other manures had comparatively a very slight effect. Indeed, in a dry season, the cause of top-dressings failing is, that they encourage the growth of surface roots, which cannot endure a long drought.

The next field viewed was in barley, in which experiments had been carried on during sixteen years with the same crop, showing the possibility of cultivating corn crops successively for any number of years, if the land is well tilled, and stimulating or ammoniacal manure supplied. Also, that superphosphate alone is of very little value, nor does it greatly add to the effect of ammonia; nor are the mixed alkalies useful, but rapecake applied at the rate of one thousand pounds per acre, and nitrate of soda at the rate of two hundred and seventy-five pounds per acre, as also ammonia salts, appear each of great utility—nitrate appearing to have the preference in improving the fertility at the least expense. The unmanured land had during these sixteen years averaged twenty and one-half bushels. The manured had reached as high an average as fifty bushels.

The next experiments viewed were those on wheat, which had been carried on continuously for twenty years. Twenty-two plots of ground were tried with different manures. In these, unmanured land averaged fourteen and three quarters bushels, land yearly manured with superphosphate only averaged seventeen and three-quarters bushels, with mixed alkalies only fifteen and one-half bushels, while nitrate of soda and ammonia salts were still the most productive—nitrate of soda, when added to superphosphate and alkalies, producing an average of thirty-six and one-half bushels. Still, the nitrate alone, and the ammonia alone, were not so productive as when combined with alkalies or superphosphate. The wheat was sown on November 1st, and had suffered considerably from the frost.

The experiments on oats had only commenced in 1869, but the same results appeared. Unmanured, in 1870, yielded sixteen and one-half bushels of corn, and nine and one-eighth hundredweight of straw, while a heavy dressing of nitrate of soda with superphosphate increased both corn and straw threefold.

In the leguminous (beans and peas) crops, and in clovers, no such results appear. It is impossible, with any mixture, to grow clover or beans, for a long continuance of years, on the same land, still a plot in a rich garden soil has grown clover successively since 1854, without any manure, and this year is also very healthy in appearance. But the old garden ground has been richly manured for more than a century. Still this experiment proves that the theory of the excretions of the clover roots poisoning the soil, is not the correct one; it is more probable that the clover is starved out, when it fails.

In root crops, superphosphate of lime has been proved the most effective manure.

Experiments are now being carried on with the sugar-beet, the plants of which are dibbled in, and have come up very regularly and well; but at present it is impossible to decide on the value of the manures.

In Sawpit Field, twenty-two varieties of wheat were being grown; all looked healthy, and likely to be productive. But at this early period the varieties could not, of course, be compared, but the Red Rostock and Red Browick could be selected as having somewhat the advantage over others in luxuriance of growth.

After inspecting the laboratory, presented about fifteen years ago to Mr. Lawes as a testimonial of the subscribers to the value of his services to agriculture —passing by the garden allotments, in which nineteen or twenty acres are let, we were told by Mr. Lawes, at the rent of five shillings per twenty rods—and taking a peep at the village club-room, also established by Mr. Lawes, in which, besides reading, etc., the members have the opportunity of supplying themselves with wholesome beer at cost price—we returned to the hall,

where a handsome dinner was ready, at which Mr. Lawes presided. After dinner, the health of Mr. Lawes was proposed by Mr. Hugh E. Raynbird, who alluded the great benefits of Mr. Lawes' experiments to English agriculture, and stated that they had proved, that on clay lands the rotation of crops might in a great measure be dispensed with, although on light lands. it is probable that the present modes might be more applicable. Mr. Raynbird concluded by calling for a hearty Hampshire cheer for their hospitable entertainer. Mr. Lawes returned thanks, expressing his gratification in meeting practical agriculturists.

The meeting then concluded, and the party returned to the train at Harpenden, much gratified and instructed by the events of the day. Mr. Lawes, who accompanied the party round the farm, was unwearied in the explanations which were necessary where so great a variety of experiments were being carried on. The thoroughly clean and practical manner in which the farm crops were cultivated excited admiration; the crops bid fair to be productive, much more so than the soil, naturally a rather poor, stony clay, would appear calculated to produce.—*Gardeners' Chronicle, in N. B. Agriculturist, June* 28.

MANGOLDS AS FOOD FOR SHEEP.

To the Editor of the Mark Lane Express:

SIR—It appears to me that one of the most interesting parts of farming is, that one learns a wrinkle or two almost every year. Last year I had an enormous crop of mangold-wurzels, and although I kept my usual head of stock, they appeared to make scarcely any impression upon my store. I bought fatting cattle, contrary to my usual custom (for I am a breeder of stock), high as they are in price; for I could not bear the thought of my beautiful orange globes becoming a mass of rotten pulp. I advertised one hundred tons for sale; but instead of selling tons, I have only succeeded in selling a few hundredweights. To give you an idea of the state of mind we were in, a friend of mine called, and, on looking over the stock, said to my herdsman: "Well, John, how are you getting on?" "All well, sir; only we are distracted about them mangels." I resigned myself to what appeared to be my inevitable fate—that I should have to spread my beauties over the land for manure, never dreaming that when my ewes and lambs were turned out on fresh fields and pastures new, they would look at a mangold; but, to my surprise and delight, they actually prefer the mangolds. They were lambed down on a twenty-acre grass-field, where I kept them eating mangolds and hay as long as I dared, and when I opened the gate into an adjoining forty-acre field, that had not had a hoof on it since November, I expected they would not have returnd for a considerable period—at least, until the old pasture had been refreshed; but, to my surprise, though they wandered about during the day-time, they invariably returned to pick up any shells of mangolds that might be left. Seeing this, I ordered the supply to be kept up, and now one hundred and twenty ewes, with their lambs, consume a cart-load of mangolds every twenty-four hours, so completely, that they do not leave a piece as big as half-a-crown; and the lambs seem as partial to them as do their mothers.

Wrinkle No. 2.—I used to gives my ewes half a pound of oats whilst their lambs were with them, and I invariably found that many of them became ragged, and lost a portion of their wool from their backs and shoulders. My supply of roots being so large, I have this season not given any oats. The result is, that they have scarcely shed an ounce of wool.

Wrinkle No. 3.—Now, as I have found out that you may grow on the same field, year after year, mangolds, not only without deterioration, but with manifest increase (having grown for the last ten years mangolds on a small field of two acres), I grow more and more mangolds. About three years ago, I had about two hundred lambs, three-parts bred. I was obliged to sacrifice one hundred of them at 18s. 6d. a-piece, for my pastures were bare, brown and dusty; those same lambs were sold at 27s. 6d. a-piece. Now, if I had had an unlimited supply of mangolds, I find out that I might have put that 27s. 6d. a-piece into my own pocket, instead of allowing it to go into the dealer's, and been spared the humiliation, when I begged for another sixpence, of being told that he considered he was doing me a great favour in taking them at all, but as I was an old customer, he would do it to oblige me.

Your obedient servant, F. G.

May 24, 1871.

THE HELIOTYPE PROCESS.

From *Nature*, June 1, 1871.

At one of the recent *soirées* of the Royal Society given by General Sabine at Burlington House, Messrs. Edwards and Kidd exhibited at work the new heliotype process, whereby photographic pictures can be very rapidly copied in by the aid of the printing-press. The process is very inexpensive, and so rapid that if one of the pages of NATURE were sent to the works, it could be copied by photography, and within two or three hours after receipt, pictures could be turned out as fast as the printing-press could work them off. A few days ago I went over the works to examine the process, and a gentleman, who brought an engraving to the proprietors just as I arrived, saw the press printing off very good copies before I left, the interval being about two hours. The works are at some distance out of London, free from the smoke and dust.

The following is an outline of the history of the process:—Mr. Mungo-Ponton, of Clifton, discovered some years ago that if a dried film of gelatine and bichromate of potash be exposed to light, the film is afterwards insoluble in warm water. M. Poitevin afterwards noticed that where light had acted upon such a film, it took greasy ink just like a lithographic stone, whereas those parts on which light had not acted, absorbed water. In the attempt to produce pictures on this principle, he poured a mixture of warm gelatine and bichromate of potash over a lithographic stone, or plate of metal, and when the film was dry he exposed it to light under a negative. Where the light had acted the film became water-proof, and where it had not acted the gelatine swelled up like a sponge. This surface of hills and valleys prevented him from getting good pictures when he attempted to print from it on the lithographic principle.

Messrs. Tessè du Motay and Marechal tried the process just mentioned, and by carefully selecting their subjects, choosing those only in which there was little contrast of light and shade, they reduced the elevations and depressions on the surface of the film to a minimum, and thus obtained some very fair pictures, but after a very few had been printed off, the gelatine printing surface broke up. The next man who took up the process was

Albert of Munich. Before his time, whenever a sufficiently thick film of gelatine to stand wear and tear had been used, the elevations and depressions were so great that the film could not be inked. Albert took a plate of glass about half an inch thick, covered it with a thick coating of bichromated gelatine, and after it was dry exposed it all over to light to make it insoluble. Afterwards he covered the surface thus prepared with a very thin coating of sensitive gelatine, on which the picture was printed from the negative. By this process he obtained some exceedingly beautiful and perfect pictures, and he is producing them by this plan at the present time.

Mr. Ernest Edwards took up the process at this point about a year ago. He made a thick leathery film at the outset by adding alum to the warm gelatine solution. He found that films so prepared still retained the lithographic-stone-like property; they will scarcely swell up in water at all. They are insoluble, and they resist the wear and tear of the printing-press very satisfactorily.

The working details of the heliotype process are as follows. The films are prepared upon large sheets of accurately levelled finely ground glass, technically known as "greyed glass;" about 22 inches by 18 inches is a convenient size. The surface of the glass is first polished by means of a clean piece of rag, with a little solution of wax in ether; the exceedingly thin film of wax thus left upon the glass permits the dried gelatine film to come off easily. The glass plates after being waxed are levelled, and then a measured quantity of a warm mixture of gelatine, bichromate of potash, chrome alum, and water, is poured upon each plate from a jug with a piece of muslin tied over its mouth. The temperature of the solution in the jug is about 150° Fahrenheit, and after it is poured over the plate it sets in a very few minutes, but it requires a much longer time to dry. Curiously enough, until it is dry it is not sensitive to light; this fact was found out accidently, for at first this part of the operations was carefully carried on in yellow light.

After the film has set, the plates are taken into a dark room to dry. If any of the fumes given off by burning gas escape into this room, they act upon the film just as light would do, therefore although a gas stove is used to dry the plates, the products of combustion are very carefully carried off. The gas stove used in the works was invented by Mr. George, a dancing master at Kilburn. It is a closed iron cylinder, into which air is admitted by one pipe coming from outside the house, and the products of combustion are carried off by another. A third iron air pipe enters the bottom of the stove, curves round its sides in a spiral, and then emerges through the iron plate forming the top. Air from outside the house is warmed in this spiral, after which it escapes into the drying room, which is kept at a temperature of from 90° to 120.° At a temperature of 90° the films take about twenty-four hours to dry. As they dry they contract slightly, and thus separate themselves from the glass. These dried films are technically termed "skins"; they are of an orange colour, and about one-tenth of an inch thick. The picture is printed on them from a negative, and a faintly visible image is formed; when this image is fully out the films are removed to a dark room.

Here each skin is floated in water, and caught upon the surface of a thick plate of zinc; a flat piece of wood, edged with india-rubber is then scraped with considerable pressure over the film, so as to squeeze out all the water between the skin and the zinc. As the film still continues to absorb moisture, it is thus fixed to the zinc with the whole pressure of the atmosphere. After this the zinc with its attached film is left for half-an-hour at least in a large vessel of water, for the superfluous bichromate of potash to soak out, and then the film is no longer sensitive to light. If the film be thus soaked for several hours, or even days, it does not suffer.

The film, upon its zinc plate, is now ready for the printing-press. It is damped between each impression, just like a lithographic stone. Then it is inked, and the best roller for the purpose is found to be one made of india-rubber, backed inside with "india-rubber sponge" to give additional softness. Ordinary lithographic ink is used. If stiff lithographic ink be employed, the surface will only "bite" where light has acted most; if thin ink be used, the leathery surface will only bite in the half tones of the picture; hence each picture is produced by at least two inkings, and advantage is taken of this circumstance to use two colours, and get warm shades in the half tones. It is very interesting to see the picture gradually growing under the inking process. By this method double-printing is executed with a single pull at the press. Ordinary Albion hand printing presses are used.

The negatives worked from in this process have to be "reversed," and they may either be reversed at the time they are taken, or afterwards. In the former case, instead of the lens of the camera being pointed direct at the object or picture to be photographed, a mirror, silvered on its front surface, is interposed at an angle of 45°. Another method of reversal is to take an ordinary unvarnished negative, and coat it either with a solution of india-rubber, or a solution of gelatine and alum. When the film is dry the plate is accurately levelled; it is then coated with a pool of collodion as thick as it will hold, and this collodion is then allowed to dry. Next the film is cut through with a penknife near the edges of the picture, and the plate is placed in water, where the negative soon floats off the glass, after which it is dried between blotting paper. The flexible negatives thus obtained are very durable, except when bad india-rubber is used in reversing them.

When a batch of pictures has been printed from any particular skin, the film is taken off the zinc plate, and put away until wanted again. Mr. Edwards says the skins will stand a vast amount of wear and tear, and he showed me one from which he said 1,500 pictures had been printed, the last impression being as good as the first, and the skin ready for further work if necessary.

By this process many of Mr. Nasmyth's lunar pictures have been copied, and while on the premises I saw some work then being executed for Mr. Ruskin and others known in the world of art and science. Bones, and some descriptions of anatomical specimens, are very easily photographed and printed by this process, which is also well adapted for landscapes and architectural subjects. If it be desired, a glaze is given to the finished prints in a very simple way. A little powdered magnesia is sprinkled over the surface of the print, and it is then placed on a smooth board and rubbed with a pad of flannel. Magnesia belongs to the soapstone family, and when used in this way it very readily gives a surface polish to paper.

WILLIAM H. HARRISON.

THE *DIS*ADVANTAGES OF COOKED FOOD FOR ANIMALS.

From The Farmer, London and Edinburgh, April 24, 1871.

There are two sides to every question; and although it may happen that arguments as given on paper, appear very plausible, yet in the face of everyday experience the reverse often is proved to be fact. We have no desire to be cynical in the course of the following remarks, but offer the results of daily observation—personal and otherwise—in the hope that a subject of vital importance to stock-owners and feeders may gather strength, and efforts culminate in the general advancement toward success in one of the most valuable departments of our social economy—the management of our domestic animals.

In the science of animal physiology there are many profound conditions to be taken into consideration, and those who have undergone but a partial tuition in it are apt to confound effects with causes. The distinction between these is all-important, and hence our reason for referring to the subject.

A paper on the "Advantages of Cooked Food for Animals," read before the American Agricultural Institute lately, is no exception to the statement we have made. The writer, Mr. J. D. Curtis, has the happy knack of making up a readable paper. It is the subject of animal physiology which appears to us to be at variance with facts, not the general tendency of the lecture.

"Constipation is the great curse of animals, and the cause of nearly all the diseases which afflict them." As an argument upon which to found data for the *cause* of disease and necessity of cooking the food of animals, this is probably the weakest. Constipation, as will be found by a reference to every authentic work on medical and veterinary literature, is to be regarded as a *sign* or the *effect*, not the cause of disease. After constipation has fully set in, the lives of men and animals are frequently doomed, in a stage at which the action of the cooked food would be of little good. Whatever results are made known as disorder by the state of the digestive organs, it must be borne in mind that previous conditions of mal-action must have existed before those signs could be produced.

"A perpetual summer of green food, prepared by 'Dame Nature,' would obviate all this, but a prolonged diet upon the dried juices and woody fibre of hay and straw, and the hard, unyielding cereal, exhausts the gastric juice, breaks down the delicate organism of digestion, irritates the membranes, and inflames the intestines, hence the emaciation or disease, and the stock come out poor in the spring." We argue differently. If "Dame Nature" had considered it wise that animals as well as men should enjoy a perpetual summer, she would have ensured the institution, and Mr. Curtis should remember that the nature of green food is such as, affording but little nourishment, animals are induced to take the necessary amount of exercise in the search of it, which becomes almost constant. An animal at grass is said to be continually feeding; but when the cold of winter comes his supply in the fields is cut off, and food is given to him in bulk in a covered building or a yard. No roaming is necessary then, and when injudicious or parsimonious owners act on the principle of causing a summer's grass to make up for a winter's starvation, we may expect that conditions the reverse of health will be established. Dame Nature, however, has so ordered matters that when summer green crop is exhausted, the various tubers have ripened and are available for use. These, with a judicious mixture of the cereals, good shelter, water, etc., are all that are required, and the statement may be accepted as a rule for stock-feeders to adopt. If the principle were more generally accepted, stock management would be a greater certainty than it is, but too frequently the disorders of digestion are produced by the most indigestible food, want of shelter and proper exercise, which in winter time operate strangely and powerfully

Mr. Curtis says: "It is not the quantity of food taken into the stomach, but the amount absorbed by it, which benefits the system." We think a slight alteration in the construction of this sentence would approach nearer to the fact; it is the amount digested that confers the benefit, not that which is absorbed, as everyday truths abundantly shew. Farmers in every part of the world have had cause to lament the loss of their prime heifers from anthrax, known as black leg, black quarter, speed, etc., the older stock from splenic apoplexy, sheep from braxy, and horses from albuminous neprites, particularly where cooked food has been given, and these states of fatal disease arise from the amount absorbed, which constitute a blood poison. In no place do we find these conditions so common as where cooked food is given, and collateral states of neglect and mismanagement occur, yet we find such erroneous principles recommended, while science is thoroughly ignored.

Thorough mastication of food is recommended as all-important, but the author has omitted to observe that cooked food rarely calls forth the necessary process, and no amount of cooking will render the food more nutritious. Mastication is essential for two purposes—to break down and saturate the food with an important fluid—the saliva, that fluid effecting important changes in the nutritive elements to fit them to undergo subsequent actions by other juices of the digestive organs. It is not possible to supplant these secretions by any process of preparation by cooking or addition of fluids. Dame nature has supplied vegetable food for every season and only requires of man that he should observe the peculiarities of each, and give the benefits to animals as far as possible. It is a decided mistake to cook the food of animals when it is sound and sweet. The mistake, so called, of supplying the dry food in winter, is more apparent than real. The exercise of common sense is called for in order to regulate the practice with suitable roots, and proper shelter and warmth, more than is usually done. It is a mistake to neglect the young stock so much as is commonly done. If more attention were paid to them, and the supplying of artificial and natural food increased during the period of their most active growth, adverse states would not be so general, and the remedy less sought after in useless preparations of food which run into expenses.

Among working horses, the effects of cooked food are something marvellous. Cholic, and indigestion generally, with disease of the liver and kidneys, is of common and fatal occurrence. It may be more easily understood to say such preparations are quite unnatural, as the digestive organs are constituted to act upon the most nutritive grains. It is also commonly believed that animals, especially horses, pass much away by the bowels that ought to be digested and appropriated to the system. This question requires more philosophical research before it can be definitely and accurately settled, but we can go so far as to say, that when the mascatory organs are in good order, and digestion perfect, a proper allowance of food is thoroughly assimilated. *Apparently whole* grains may be found in the excrement, but upon close examination they will turn out to be the *shells only*, which by the action of the digestive juices, have been divested of their internal nutrient parts. Some persons look upon digestion as a process in which everything must be utilized for the building up of tissue. They forget it is quite as essential that other substances should be present—these non-nutritious in themselves, but by their constitution and presence give bulk to the rest, and assist in their general reduction

in the stomach of the higher animals, exactly as the sand and pebble act in the crops of birds.

The success of feeding our domestic animals does not lie in the way of cooking food and administraiion of condiments, but in a judicious management generally, in which the peculiar features of organization, physiology, geologo, meteorology and hygrometrics, play their respective parts, and agricultural success will never be certain until these branches of science are more definitely acknowledged.

BREADSTUFFS SUPPLY AND PRICES.

From the *Commercial and Financial Chronicle*, New York, August 5.

The position and prospects of the markets for flour and wheat demand, just now, more careful consideration and more critical examination than appear, from the erratic course of prices, to have been given them of late. The *Chronicle* pointed out, immediately after the surrender of Paris to the Germans, the probability that all the benefits to the trade that might be expected to flow from that event, had been anticipated. This view proved to be correct. And, again, a few weeks later, we expressed the opinion that the large stocks of wheat which had been accumulated through speculative operations, could not probably be marketed without submitting to lower prices. The difficulties in the way of holders were augmented by the increased yield and early harvest of our winter wheat, which, being thrown upon the market at the earliest moment, contributed to an important decline in prices, both of flour and wheat. From $7 *a* $7.15, as the price of extra State flour in the first week of February, there has now been a decline to $5.50 *a* $5.75. From $1.70 *a* $1.72, as the price of amber winter wheat in April, there has been a decline to $1.35 *a* $1.36; and in the meanwhile prime spring wheat has declined from $1.60 *a* $1.62 to $1.31 *a* $1.32. This decline is due to three causes besides those already named: an advance in ocean freights; a decline of a shilling a quarter in the English markets; and, latterly, the leading holders have been "throwing overboard" the remnants of their stocks, and striving as earnestly to break down prices as they had before endeavoured to support them, in order, as they say, to get a good starting point for the next crop. This latter cause has of late had more effect than the other two, because the export demand has continued good; receipts, notwithstanding the larger crop of winter wheat, are not so large as last year, showing that very little of the old crop has been carried over; and freights, though high, are not excessively so, and the supply of room is large.

We would, therefore, utter a note of warning against crowding prices down so low that the new crop of wheat may not be marketed with sufficient rapidity to permit the accumulation of a liberal stock in store here previous to the closing of canal navigation. We see no reason to anticipate extreme low prices for the coming year. The yield for 1871 promises to be rather less than in 1870. The only increase is in our winter wheat, the whole of which constitutes but a moiety of the aggregate supply. Our crop of spring wheat is reported a failure in some sections, and a small percentage of falling off in the yield of spring wheat will offset a great relative increase in the yield of winter wheat. The season has certainly not been a favorable one in Great Britain, and from portions of the Continent unfavourable reports reach us. Stocks are now liberal in many markets; in others, ours among the number, there is a very small supply; and, in the aggregate, the principal markets of the United States and Great Britain do not show more than sixty per cent of the wheat on hand which was on hand one year ago. It would appear, therefore, that in the face of the liberal supplies called out by high prices, and the check upon consumption imposed by these high prices and an exhaustive war, stocks have largely diminished during the past year. How, then, are we to get along another year without increased supplies, with consumption increased by peace and the consequent revival of commerce and manufactures, and by the lower prices now ruling? Certainly, thus far, the export demand has shewn no signs of falling off; it will probably increase; hence there is very little reason to anticipate that prices will be low for any considerable period.

The movement in corn surprises everybody. The extent of the home demand is really astonishing, and yet it finds explanation in the scarcity and high prices of hay and oats. Corn is the only cheap feeding vegetable product that we have. Its condition is excellent, and favourable to storing on speculation. The same fact favors a large export, and, although receipts have been excessive, the whole supply has found a ready market at a moderate decline, with every indication that slightly reduced supplies would produce a sharp reaction. It is too early to speak definitely of the corn crop of 1871, for it is still subject to injury from frost and wet weather, and, of course, therefore, it would be idle to speculate upon the future of prices.

MEAT PRESERVING.

Many methods have been introduced to meet the ever-growing want of England—cheap animal food. Some of these methods have been successful, and others the reverse. We could ill spare the little that is already placed at our disposal by Australian and other meat companies; and the highly remunerative character of investments in the preserved-meat trade affords a sure guarantee for greater efforts in the future than any that have hitherto been made. Liebig's process has been carried on very profitably at home as well as abroad; but the preparation of extract of meat has been declared wasteful, from the small amount of stimulating material preserved, and the carting away of all albuminoid matters to the manure-heap. A new plan has been introduced by an engineer, who has experience in sugar refineries and other extensive works in hot latitudes, which ensures a practical and economical solution of one of the most important problems of the day. Mr. T. F. Henley does away with steeping meat in water, and with boiling and otherwise treating it in the most costly way. He simply squeezes a definite amount of juice out of the fibre, and by mechanical dessication preserves the latter intact. The pressed meat thus obtained contains ten per cent of alcoholic extract and salt, and over fifty per cent of fibrine and other albuminoid constituents. It is exceedingly rich, and so is the meat-juice, which Mr. Henley evaporates in vacuum pans. The juice contains about fifteen per cent of alcoholic extract, and over fifty per cent of albumen. The ancient method of abstracting water only from the animal matter is relied on as the preservative, and the low temperature at which the evaporation is carried on prevents any loss of flavour or other deterioration. It is, perhaps, strange that so cheap and simple a process should not have been suggested before. Mr. Henley has worked at it for some time, and perfected it so as to ensure its immediate adoption. The first works, on an extensive scale, are to be opened on the River Platte, on the Estancia Neuva Allemania, where cattle have been reared and fattened for the European markets. It is proposed to slaughter three hundred bullocks daily; and since it is stated that the hides and feet pay the first cost of the bullock and of its slaughtering, the financial prospects of the undertaking wear a promising aspect.—*British Medical Journal.*

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MISCELLANEOUS.

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Western N. Y. Horticultural	P. Barry	S. W. Wakelee	S. W. Wakelee	Rochester.

NOTICES AND DONATIONS.

Rules and Regulations of the New York College of Veterinary Surgeons. Alexander Stein, M. D., Secretary, 28 West 15th street, New York.

An account of the Organization and Progress of the Museum of Comparative Zoology at Harvard College, in Cambridge, Mass.; also Annual Report of the Trustees of the Museum; together with the Report of the Director for 1870.

Thirty-two copies of the Fifteenth Annual Report of the Secretary of the Maine Board of Agriculture, for the year 1870. (For distribution.)

Monthly Report of the Department of Agriculture, for July, 1871. Washington, D. C.

Report by the Curators of the University to the Governor of the State of Missouri, 1871.

From D. A. Bulkeley, Williamstown, Mass. Thirty-third and Thirty-fourth Annual Reports of the Board of Education of the State of Massachusetts.

Journal Mensuel des Travaux de l'Academie Nationale. June and December, 1870; January and June, 1871. Paris.

Agricultural Central Gazette for Germany. May, 1871. Berlin.

Bulletin of the Imperial Society of Naturalists in Moscow. No. 2. 1870.

Resources and Development of Kansas, by C. C. Hutchinson, Topeka. 16mo., pp. 287, with map.

Boericke and Tafel's Quarterly Bulletin of Homœopathic Literature. New York and Philadelphia. Aug. 1871.

Premium List, etc., for the Fair of the Virginia State Agricultural Society, to be held at Richmond, October 31 and November 1, 2 and 3, 1871.

Premium List for the Fair of the Indianapolis Agricultural, Mechanical and Horticultural Association, to be held at Indianapolis, September 25 to 30, 1871.

Premium List for the Fourth Annual Fair of the Arkansas State Agricultural and Mechanical Association, to be held at Little Rock, commencing October 3, 1871, and continuing four days.

Premium List for the Fair and Cattle Show of the Dutchess County Agricultural Society, to be held at Washington Hollow, September 19, 20, 21 and 22, 1871.

Premium List of the Lenox Farmers and Mechanics' Association, for its Fourteenth Annual Fair, to be held at Oneida, September 28, 29 and 30, 1871.

Premium List for the Fair of the Delaware County Agricultural Society, to be held at Walton, September 26, 27 and 28, 1871.

Premium List for the Berks County Agricultural and Horticultural Society's Annual Fair, to be held at Reading, Pa., September 12, 13, 14 and 15, 1871.

Premium List for the Exhibition of the Steuben County Agricultural Society, to be held at Bath, October 4, 5 and 6, 1871.

Premium List for the Annual Fair of the Oneida County Agricultural Society, to be held at Rome, September 18, 19, 20, 21 and 22, 1871.

Premium List for the Cattle Show and Fair of the St. Lawrence County Agricultural Society, to be held at Canton, September 12, 13 and 14, 1871.

Premium List of the Fair of the Westchester County Society of Agriculture and Horticulture, to be held at West White Plains, September 12 to 16, 1871.

Premium List of the Nineteenth Annual Illinois State Fair, to open at Du Quoin, September 25, 1871, and continue through the week.

Premium List for the Nineteenth Annual Exhibition of the Pennsylvania State Agricultural Society, to be held at Scranton, September 19, 20, 21 and 22, 1871.

Premium List for the Thirteenth Grand State Fair of the New Jersey State Agricultural Society, to be held at Waverly Station, commencing September 19, and continuing four days.

Premium List for the Twenty-first Annual Fair of the Vermont State Agricultural and Wool Growers' Association, to be held at St. Johnsbury, September, 12, 13, 14 and 15, 1871.

Premium List for the Fair of the Franklin County Agricultural Society, to be held at Malone, September 26, 27, 28 and 29, 1871.

Premium List for the Fair of the Sangerfield and Marshall Agricultural Society, to be held at Waterville, September 26 and 27, 1871.

Premium List for the Fair of the Westmoreland Agricultural Society, to be held at Hampton, Oneida county, September 27, 28 and 29, 1871.

Premium List for the Fair of the Chemung County Agricultural Society, to be held at Elmira, September 21, 22 and 23, 1871.

Premium List for the Fair of the Cayuga County Agricultural and Horticultural Society, to be held at Auburn, September 12, 13 and 14, 1871.

Premium List for the Third Annual Fair of the Tennessee Agricultural and Mechanical Association, to be held at Nashville, October 3, and continue four days.

Premium List of the Kansas State Agricultural Society for 1871. Fair at Topeka, September 11, 12, 13, 14 and 15.

Premium List of the West Virginia Central Agricultural and Mechanical Society for the Fifth Annual Fair, to be held at Clarksburg, W. Va., September 19, 20 and 21, 1871.

Premium List for the Fair of the Chenango County Agricultural Society, to be held at Norwich, September 19, 20 and 21, 1871.

Premium List of the South Carolina State Agricultural and Mechanical Society for the Third Annual Fair, to be held at Columbia, November 6, 7, 8, 9, 10 and 11, 1871; also Proceedings of the Annual Convention of the South Carolina Agricultural and Mechanical Society, held at Columbia, November 10 to 12, 1870.

Premium List for the Fair of the Galen Agricultural Society, to be held at Clyde, September 29 and 30, 1871.

Premium List for the Fair of the Seneca County Agricultural Society, to be held at Ovid, October 3, 4 and 5, 1871.

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OF

The New-York State Agricultural Society.

VOL. XXI.] ALBANY, SEPT. AND OCT., 1871. [NOS. 9 & 10.

State Agricultural Rooms.

The Secretary's Office is in the New Agricultural Hall corner of State and Lodge streets, Albany.

New-York State Agricultural Society.

AWARDS

AT THE

THIRTY-FIRST ANNUAL EXHIBITION

OF THE

NEW YORK STATE AGRICULTURAL SOCIETY,

Held at Albany, October 2, 3, 4, 5, 6, 1871.

CLASS I.—CATTLE.

No. 1. SHORT HORNS.

SHORT HORN HERD PRIZE,

Walcott & Campbell, New York Mills, N. Y., Large Gold Medal.

Bull, "Fourth Duke of Geneva;"

Red, calved August 6, 1867, bred by James O. Sheldon, Geneva, N. Y; sire Baron of Oxford (23371), dam Seventh Duchess of Thorndale by Second Grand Duke (12961), gr. d. Third Duchess of Thorndale by Duke of Gloster (11382).

Cow, "Baron Oxford's Beauty;"

Roan, calved March 11, 1868, bred by Col. Towneley, Lancashire, England; sire Baron Oxford (23375), dam British Beauty by British Prince (14197), gr. d. Lady Abbess by Cardinal (11246).

Cow, "Rosamond 7th;"

Red roan, calved May 26, 1868, bred by exhibitors; sire Weehawken, 5260, dam Rosamond, by Quarrington (10671), gr. d. May Rose 3d by Belleville (6778).

Heifer, "Lady Knightley 2d;"

Roan, calved October 11, 1868, bred by David McIntosh, Essex, England; sire Third Duke of Geneva (23753), dam Dewdrop by Prince of Saxe Coburg (20576), gr. d. Duchess by Duke of Cambridge (12742).

Heifer, "Ninth Maid of Oxford;"

Red and white, calved December 6, 1869, bred by James O. Sheldon, Geneva, N. Y.; sire Tenth Duke of Thorndale 5610, dam Third Maid of Oxford by Grand Duke of Oxford (16184), gr. d. Oxford 20th by Marquis of Carrabas (11789).

Heifer, "Atlantic Gwynne;"

Roan, calved June 10, 1870, bred by exhibitors; sire Grand Duke of Lightburne (26290), dam Orange Gwynne by Fifth Grand Duke (19875), gr. d. Ophelia Gwynne by May Duke (13320).

Heifer, "Fairy Queen;"

Red roan, calved December 23, 1869, bred by exhibitors; sire King Charles (24240), dam Jolly Queen by Prince of the Empire (20578), gr. d. Vestal Queen by Prince Alfred (13494).

BULLS OVER THREE YEARS OLD.

First prize, George Butts, Manlius, N. Y.; Treble Gloster, red, calved March 31, 1867, bred by exhibitor; sire Apricot's Gloster 2500, dam Spring Beauty by Apricot's Gloster 2500, gr. d. Silkie by same bull.. $50

Second, Walcott & Campbell, New York Mills, N. Y.; Fourth Duke of Geneva, red, calved August 6, 1867, bred by James O. Sheldon, Geneva, N. Y.; sire Baron of Oxford (23371), dam Seventh Duchess of Thorndale by Second Grand Duke (12961), gr. d. Third Duchess of Thorndale by Duke of Gloster (11382) 30

Third, Walcott & Campbell, New York Mills, N. Y.; Royal Briton, roan, calved July 26, 1868, bred by T. C. Booth, Warlaby, England; sire Lord Blithe (22126), dam Royal Bridesmaid by Prince Alfred (13494), gr. d. Royal Bride by Crown Prince (10087) ... 10

BULLS TWO YEARS OLD.

First prize, Benjamin Fellows, Clifton, N. Y.; Major, red with little white, calved May 10, 1869, bred by M. H. Cochrane, Compton, P. Q.; sire Eleventh Duke of Thorndale 5611, dam Louan 44th by Duke of Airdrie 2743, gr. d. Louan 24th by Duke of Airdrie 2743.................. 40

Second, William Simpson, Jr., New Hudson, N. Y.; Hacienda, red and white, calved July 10, 1869, bred by exhibitor; sire Minstrel 7038, dam Tedd by Orion 784, gr. d. Elizabeth by Astoria 221 25

YEARLING BULLS.

First prize, Walcott & Campbell, New York Mills, N. Y.; Second Duke of Oneida, red, calved August 3, 1870, bred by exhibitors; sire Fourth Duke of Geneva 7931, dam Thirteenth Duchess of Thorndale by Tenth Duke of Thorndale 5610, gr. d. Tenth Duchess of Thorndale by Second Grand Duke (12961)................. 30

BULL CALVES.

First prize, Walcott & Campbell, New York Mills, N. Y.; Fourth Duke of Oneida, red and white, calved January 16, 1871, bred by exhibitors; sire Baron of Oxford (23371), dam Eighth Duchess of Geneva by Third Lord Oxford (22200), gr. d. Duchess of Geneva by Second Grand Duke (12961) 20

COWS OVER THREE YEARS OLD.

First prize, George Butts, Manlius, N. Y.; Spring Beauty, red, calved April 6, 1864, bred by exhibitor; sire Apricot's Gloster 2500, dam Silkie by Apricot's Gloster 2500, gr. d. Sallie Randolph by Lord Ducie 662. $50

Second, Walcott & Campbell, New York Mills, N. Y.; Baron Oxford's Beauty, roan, calved March 11, 1868, bred by Col. Towneley, Lancashire, England; sire Baron Oxford (23375), dam British Beauty by British Prince (14197), gr. d. Lady Abbess by Cardinal (11246) 30

Third, Walcott & Campbell, New York Mills, N. Y.; Rosamond 7th, red roan, calved May 26, 1868, bred by exhibitors; sire Weehawken 5260, dam Rosamond by Quarrington (10671), gr. d. May Rose 3d by Belleville (6778) 10

HEIFERS TWO YEARS OLD.

First prize, Walcott & Campbell, New York Mills, N. Y.; Lady Knightley 2d, roan, calved October 11, 1868, bred by David McIntosh, Essex, England; sire Third Duke of Geneva (23753), dam Dewdrop by Prince of Saxe Coburg (20576), gr. d. Duchess by Duke of Cambridge (12742) 40

Second, Walcott & Campbell, New York Mills, N. Y.; Mistress Ford, roan, calved December 11, 1868, bred by George S. Foljambe, Nottinghamshire, England; sire Lord Lyons (26677), dam Mrs. Quickly by Prince of Windsor (22638), gr. d. Queen of the May by May Duke (16553)....... 25

Third, George Butts, Manlius, N. Y.; Souvenir, red, calved May 3, 1869, bred by exhibitor; sire Treble Gloster 7331, dam Spring Beauty by Apricot's Gloster 2500, gr. d. Silkie by Apricot's Gloster 2500......... 10

YEARLING HEIFERS.

First prize, Walcott & Campbell, New York Mills, N. Y.; Fairy Queen, red roan, calved December 23, 1869, bred by exhibitors; sire King Charles (24240), dam Jolly Queen by Prince of the Empire (20578), gr. d. Vestal Queen by Prince Alfred (13494)....................... 30

Second, Walcott & Campbell, New York Mills, N. Y.; Ninth Maid of Oxford, red and white, calved December 6, 1869, bred by James O. Sheldon, Geneva, N. Y.; sire Tenth Duke of Thorndale 5610, dam Third Maid of Oxford by Grand Duke of Oxford (16184), gr. d. Oxford 20th by Marquis of Carrabas (11789)......................... 20

Third, Walcott & Campbell, New York Mills, N. Y.; Atlantic Gwynne, roan, calved June 10, 1870, bred by exhibitors; sire Grand Duke of Lightburne (26290), dam Orange Gwynne by Fifth Grand Duke (19875), gr. d. Ophelia Gwynne by May Duke (13320) 10

Heifer Calves.

First prize, Walcott & Campbell, New York Mills, N. Y.; Second Duchess of Oneida, red, calved January 25, 1871, bred by exhibitors; sire Fourth Duke of Geneva 7931, dam Twelfth Duchess of Thorndale by Sixth Duke of Thorndale (23794), gr. d. Fifth Duchess of Thorndale by Imperial Duke (18083).......... $20

Second, Walcott & Campbell, New York Mills, N. Y; Brenda, roan, calved November 27, 1870, bred by exhibitors; sire Fourth Duke of Geneva 7931, dam Berlina by Lord Mayor of Oxford 4954, gr. d. Bertha by Duke of Thorndale 2787............. 10

Third, George Butts, Manlius, N. Y.; Gloster's Gem, red, calved February 7, 1871, bred by exhibitor; sire Treble Gloster 7331, dam Strawberry by Oscar 6016, gr. d. Spring Beauty by Apricot's Gloster 2500..Commended.

Your committee, at your request, examined the two year old bull "Knight of St. Michaels," exhibited by Mr. F. W. Gray, Quebec, Canada, which was not entered in time to compete. He is a bull of considerable merit, and had he been shown in his proper class, would have taken the first prize.

Thomas H. Bell, *Eatontown, N. J.*
Samuel Thorne, *New York.*

No. 2. Devons.

DEVON HERD PRIZE.

Joseph Hilton, New Scotland, N. Y., Large Gold Medal.

Bull, "Prince of Wales;"

Calved August 31, 1864, bred by H. M. the Queen of England; sire Prince Alfred (709), dam Peony by Saracen (520a), gr. d. Crocus by Baronet (6).

Cow, "Belle 2d;"

Calved February 28, 1865, bred by exhibitor; sire Sachem (554), dam Belle by Albert (2), gr. d. Fanny by Bloomfield (148).

Cow, "Fdith 2d;"

Calved October 26, 1866, bred by exhibitor; sire Sachem (554), dam Edith, imported by Mr. L. G. Morris, Fordham, N. Y.

Cow, "Edith 3d;"

Calved November 2, 1867, bred by exhibitor; sire Sachem (554), dam Edith, imported by Mr. L. G. Morris, Fordham, N. Y.

Cow, "Nonpareil 5th;"

Calved January 10, 1868, bred by exhibitor; sire Napoleon, dam Nonpareil 3d by Empire 2d (425), gr. d. Nonpareil (imp.).

Heifer, "Belle 4th;"

Calved April 10, 1869, bred by exhibitor; sire Prince of Wales, dam Belle 2d by Sachem (554), gr. d. Belle by Albert (2).

Heifer, "Edith 4th;"

Calved February 3, 1870, bred by exhibitor; sire Prince of Wales, dam Edith 2d by Sachem (554), gr. d. Edith, imported by Mr. L. G. Morris, Fordham, N. Y.

Bulls over Three Years Old.

First prize, Joseph Hilton, New Scotland, N. Y.; Prince of Wales, calved August 31, 1864, bred by H. M. the Queen of England; sire Prince Alfred (709), dam Peony by Saracen (520a), gr. d. Crocus by Baronet (6)........................ $30

Second, George L. Haines, Fultonham, N. Y.; Captain, calved September 25, 1864, bred by Joseph Hilton, New Scotland, N. Y.; sire Sachem (554), dam Edith, imp...... 20

Third, Marshall B. Champlain, Cuba, N. Y.; Prince, calved March 20, 1867, bred by William Simpson, Jr., New Hudson, N. Y.; sire Westchester 370a, dam Alice by Don Carlos (346), gr. d. Pawnee by Exeter (178).......................... 10

Bulls Two Years Old.

Second prize, Walter Cole, Batavia, N. Y.; Lovely's Huron 3d, calved February, 1869, bred by exhibitor; sire Queen Anne's Huron 320, dam Lovely 18th by Young Exeter (765), gr. d. Lovely 3d by Washington (130).................. 20

Yearling Bulls.

First prize, Joseph Hilton, New Scotland, N. Y.; Prince of Wales 8th, calved September 31, 1870, bred by exhibitor; sire Prince of Wales, dam Nonpareil 5th by Napoleon, gr. d. Nonpareil 3d by Empire 2d (425).................. 25

Second, Walter Cole, Batavia, N. Y.; Iroquois 2d, caved March 29, 1871, bred by exhibitor; sire Iroquois, dam Noriña by May Boy (71), gr. d. Nora by Meguntícook (251) 15

Third, James M. Rockwell, Butternuts, N. Y.; Billy, calved March 20, 1870, bred by Truman Baker, Earlville, N. Y.; sire Mohawk, dam Lily by Huron 2d (250), gr. d. Extra by Bishop (11)................. 10

Bull Calves.

First prize, W. E. Arnold, Otego, N. Y.; Prince Albert, calved May 1, 1871, bred by exhibitor; sire Young Washington 387, dam Princess Beatrice by Crown Prince (604), gr. d. Victoria 20

Second, Joseph Hilton, New Scotland, N. Y.; Prince of Wales 9th, calved February 10, 1871, bred by exhibitor; sire Prince of Wales, dam Belle 2d by Sachem (554), gr. d. Belle by Albert (2)................. 10

Cows over Three Years Old.

First prize, Joseph Hilton, New Scotland, N. Y.; Edith 2d, calved October 26, 1866, bred by exhibitor; sire Sachem (554),

dam Edith, imported by Mr. L. G. Morris, Fordham, N. Y. $30

Second, Walter Cole, Batavia, N. Y.; Lovely 18th, calved in 1862, bred by Ambrose Stevens, Batavia, N. Y.; sire Young Exeter (765), dam Lovely 3d by Washington (130), gr. d. Lovely by Meganticook (251) 20

Third, W. E. Arnold, Otego, N. Y.; Daisy, calved June 22, 1865, bred by exhibitor; sire Young Exeter (765), dam Tiara 2d by Washington (130), gr. d. Tyra by Tecumseh (567) 10

HEIFERS TWO YEARS OLD.

First prize, Joseph Hilton, New Scotland, N. Y.; Belle 4th, calved April 10, 1869, bred by exhibitor; sire Prince of Wales, dam Belle 2d by Sachem (554), gr. d. Belle by Albert (2) 30

Second, Walter Cole, Batavia, N. Y.; Artless, calved May 25, 1869, bred by Ira H. Butterfield, Lapeer, Mich.; sire Batavia 159, dam Helena 25th by Omer Pasha (473), gr. d. Helena 7th by May Boy (71)...... 20

Third, C. H. Jewell, Westville, N. Y.; Edith 2d, calved April, 1869, bred by exhibitor; sire Frank Baker 2d 218, dam Edith by Sir Walter Raleigh (560), gr. d. Premium by Baltimore (364) 10

YEARLING HEIFERS.

First prize, Joseph Hilton, New Scotland, N. Y.; Edith 4th, calved February 3, 1870, bred by exhibitor; sire Prince of Wales, dam Edith 2d by Sachem (554), gr. d. Edith, imported by Mr. L. G. Morris, Fordham, N. Y................. 25

Second, J. M. Rockwell, Butternuts, N. Y.; Queen of Cloverdell, calved June 3, 1870, bred by exhibitor; sire Otsego 303, dam Funny by Tinsel 124, gr. d. Flounce by Tuscarora 134........................ 15

HEIFER CALVES.

First prize, Joseph Hilton, New Scotland, N. Y.; Kitty, calved March 20, 1871, bred by exhibitor; sire Prince of Wales, dam Ida by Empire (424), gr. d. Edith, imported by Mr. L. G. Morris, Fordham, N. Y....................... 20

Second, Walter Cole, Batavia, N. Y.; Lovely, calved March, 1871, bred by exhibitor; sire Queen Anne's Huron 320, dam Lovely 18th by Young Exeter (765), gr. d. Lovely 3d by Washington (130)................ 10

R. H. VAN RENSSELAER, *Morris, N Y.*
TOBIAS BOUCK, *Schoharie, N. Y.*

No. 3. HEREFORDS.

HEREFORD HERD PRIZE.

E. Corning, jr., Albany, N. Y.... Large Gold Medal.

Bull, "Taurus;"

Red with white face, calved April, 1868, bred by exhibitor; sire Major, dam Victoria 5th by S. Goddard, gr. d. Victoria 4th.

Cow, "Victoria 5th;"

Red with white face, calved August, 1859, bred by exhibitor; sire, S. Goddard, dam Victoria 4th by Cardinal Wiseman, gr. d. Victoria 1st (imp.).

Cow, "Princess 2d;"

Red with white face, calved April, 1861, bred by exhibitor; sire Washington, dam Princess (imp.) by Newton.

Cow, "Marchioness;"

Red with white face, calved March, 1861, bred by exhibitor; sire Washington, dam Lady, imported by exhibitor.

Cow, "Hope;"

Red with white face, calved May, 1867, bred by exhibitor; sire Major, dam Lady, imported by exhibitor.

Heifer, "Princess 3d;"

Red with white face, calved March, 1869, bred by exhibitor; sire Major, dam Princess 2d by Washington, gr. d. Princess 1st.

Heifer Calf, "Grace;"

Calved April, 1871, bred by exhibitor; sire Taurus, dam Hope by Major, gr. d. Lady, imported by exhibitor.

BULLS OVER THREE YEARS OLD.

First prize, E. Corning, Jr., Albany, N. Y.; Taurus, red with white face, calved April, 1868, bred by exhibitor; sire Major, dam Victoria 5th by S. Goddard, gr. d. Victoria 4th $30

Second, Justus Crandall, Portlandville, N. Y.; Lord Bateman, red with white face, calved 1868, bred by George Clark, Springfield, N. Y.; sire Berwick (imp.), dam Pretty Maid by Young Gaylad (1463), gr. d. Pretty Maid by Berrington (435).................. 20

BULL CALVES.

First prize, E. Corning, Jr., Albany, N. Y.; George, dark red with white face, calved March, 1871, bred by exhibitor; sire Taurus, dam Victoria 5th by S. Goddard, gr. d. Victoria 4th..................... 20

COWS OVER THREE YEARS OLD.

First prize, E. Corning, Jr., Albany, N. Y.; Marchioness, red with white face, calved March, 1861, bred by exhibitor; sire, Washington, dam Lady, imported by exhibitor............................ 30

Second, E. Corning, Jr., Albany, N. Y.; Hope, red with white face, calved May, 1867, bred by exhibitor; sire Major, dam Lady, imported by exhibitor.................. 20

Third, Justus Crandall, Portlandville, N. Y.; Evening Star, red with white face, calved 1867, bred by George Clark, Springfield, N. Y.; sire Lord Bateman, dam Belle (imp.) by Vanguard, gr. d. Beauty by Monarch (504) 10

HEIFERS TWO YEARS OLD.

First prize, E. Corning, Jr., Albany, N. Y.; Marchioness 2d, red with white face, calved

April 1867, bred by exhibitor; sire Major, dam Marchioness by Washington, gr. d. Lady, imported by exhibitor $30

Yearling Heifers.

First prize, Justus Crandall, Portlandville, N. Y.; Clover, red with white face, calved April 26, 1870, bred by exhibitor; sire Lord Bateman, dam Evening Star by Lord Bateman, gr. d. Belle (imp.) by Vanguard (504)........................ 25

Heifer Calves.

First prize, E. Corning, Jr., Albany, N. Y.; Grace, calved April, 1871, bred by exhibitor; sire Taurus, dam Hope by Major, gr. d. Lady, imported by exhibitor....... 20

Second, Justus Crandall, Portlandville, N. Y.; Primrose, red with white face, calved Nov. 10, 1870, bred by exhibitor; sire Lord Bateman, dam Lady Otsego by Berwick (imp.), gr. d. Filbert by Dewshall (358).. 10

No. 4. Ayrshires.

AYRSHIRE HERD PRIZE.

Brodie, Son & Converse, Rural Hill and Woodville, N. Y., Large Gold Medal.

Bull, "Woodville Chief;"

———, calved ———, imported by exhibitors.

Bull, "Duke of Hamilton;"

———, calved ———, imported by exhibitors.

Cow, "Flora Temple 3d;"

Red and white, calved April 2, 1865, bred by John F. Converse, Woodville, N. Y.; sire John Gilpin 222, dam Flora Temple by Kilburn 229, gr. d. Peablow by Kilburn 229.

Cow, "Ayrshire Lass;"

———, calved ———, imported by exhibitors.

Cow, "Ocean Belle;"

———, calved ———, imported by exhibitors.

Cow, "Kampsey Maid;"

———, calved ———, imported by exhibitors.

Heifer, "Beulah;"

———, calved ———, imported by exhibitors.

Heifer, "Lady Ayr;"

———, calved ———, imported by exhibitors.

Heifer, "Lady Roger;"

———, calved ———, imported by exhibitors.

Heifer, "Bessie Bell;"

———, calved ———, imported by exhibitors.

Heifer, "Lady Mary;"

———, calved ———, imported by exhibitors.

Heifer, "Killarnie Maid;"

———, calved ———, imported by exhibitors.

Bulls over Three Years Old.

First prize, John L. Gibb, Quebec, Canada; Mars, red and white, calved April 30, 1867, bred by W. A. MacLachlan, Auchentrieng, Scotland $30

Second, William Birnie, Springfield, Mass.; Rob Roy, dark red and white, calved September 16, 1868, bred by exhibitor; sire Honest John 199, dam Topsy by John Anderson 33, gr. d. Kitty 6th by Blossom 10....... 20

Third, Walcott & Campbell, New York Mills, N. Y.; Ivanhoe, red and white, calved May 10, 1867, bred by exhibitors; sire Tarbolton 372, dam Tibbie (imp.) by Blackthorn, gr. d. Beith by Sir Samuel 10

Bulls Two Years Old.

First prize, Hawks & Gates, Wells Bridge, N. Y.; Lord Cuthbert, red and white, calved March 10, 1869, bred by N. S. Whitney, Montreal, Canada; sire Dominion 507, dam Lady Cuthbert 2d by Cuthbert (imp.), gr. d. Lady Cuthbert 30

Second, John Stryker, Rome, N. Y.; Treasurer, red and white, calved September 23, 1869, bred by Walcott & Campbell, New York Mills, N. Y.; sire Tarbolton 372, dam Treasure by Baldie 90, gr. d. Highland Mary by Kilburn 229.................... 20

Third, Thomas Thompson & Son, Dunbar, Ontario; Sir Colin, white with dark red spots, calved May 28, 1869, bred by exhibitors; sire Heather Jock, 37 Canada Register, dam Lily by Garibaldi, gr. d. by Sir Colin 67............................ 10

Yearling Bulls.

First prize, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Duke of Hamilton, ———, calved ———, imported by exhibitors................................ 25

Second, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Woodville Chief, ———, calved ———, imported by exhibitors 15

Third, F. D. Curtis, Charlton, N. Y.; Heber Kimball, red and white, calved September 11, 1870, bred by Charles S. Lester, Saratoga Springs, N. Y.; sire Walton 393, dam Marion by Tam 72, gr. d. Nannie by Norribo 50................................ 10

Bull Calves.

First prize, John L. Gibb, Quebec, Canada; Lord Avondale, red, a little white, calved November 15, 1870, bred by John Fleming, imported by exhibitor.................. 20

Second, M. E. Myers, Charlton, N. Y.; Star of the North, red and white spotted, calved March 13, 1871, bred by exhibitor; sire Stark 360, dam Norine by Zero 401, gr. d. Jenny Lind......................... 10

Third, Thomas Thompson & Son, Dunbar, Ontario; Robby Burns, red and white flecked, calved March 14, 1871, bred by exhibitors; sire Heather Jock, 37 Canada Register, dam Minnie by Rob Roy (imp.), gr. d. White Lily...............Commended

Cows Over Three Years Old.

First prize, William Birnie, Springfield, Mass.; Topsy Turvy, red and white, calved September 1, 1866, bred by exhibitor; sire Honest John 199, dam Topsy by John Anderson 33, gr. d. Kitty 6th by Blossom 10 .... $30

Second, James Miller, Penn Yan, N. Y.; Heather Bell, red and white, calved May, 1868, bred by James Brodie, Rural Hill, N. Y.; sire John Gilpin 222, dam Jenny Lind by Rob Roy (imp.), gr. d. Peablow by Kilburn 229 20

Third, Thomas Thompson & Son, Dunbar, Ontario; Annie, red and white spotted, calved June 1, 1868, bred by James Wilson, Boghall, Glasgow, Scotland, imported by exhibitors 10

Heifers Two Years Old.

First prize, Charles S. Lester, Saratoga Springs, N. Y.; Susie, red and white, calved March 22, 1869, bred by exhibitor; sire Morton 278, dam Fairy by King Coil 40, gr. d. Miss Miller (imp.) 30

Second, William Birnie, Springfield, Mass.; Maggie Morton, dark red and white, calved January 3, 1869, bred by exhibitor; sire Honest John 199, dam Miss Morton (imp.) by Young Geordie, gr. d. Brawney....... 20

Third, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Lady Ayr, ——, calved ——, imported by exhibitors.... 10

Yearling Heifers.

First prize, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Killurnie Maid, ——, calved ——, imported by exhibitors 25

Second, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; ——, ——, calved ——, imported by exhibitors 15

Third, Charles S. Lester, Saratoga Springs, N. Y.; Nannie H., red and white, calved Sept. 12, 1870, bred by exhibitor; sire Walton 393, dam Peggie by John Anderson 33, gr. d. Daisie 10th by Blossom 2d.......... 10

Heifer Calves.

First prize, William Birnie, Springfield, Mass.; ——, red and white, calved July 15, 1871, bred by exhibitor; sire Rob Roy 823, dam Kitty 6th by Blossom 10, gr. d. Kitty 5th by Duke 20

Second, Walcott & Campbell, New York Mills, N. Y.; Bridesmaid, red and white, calved December 5, 1870, bred by exhibitors; sire Lomond 680, dam Bride by Tarbolton 372 (imp.), gr. d. Challenge 4th by Robert Bruce 314 10

Third, Thomas Thompson & Son, Dunbar, Ontario; Rose of Carron, red and white flecks, calved April 20, 1871, bred by exhibitors; imported in cow Rossie 2d, September, 1870.......... Commended.

Your committee respectfully report that the above awards are made entirely on Ayrshire characteristics; the peculiarities of this particular breed are compared one with another as Ayrshires and not at all with others, and not at all on general merit. They have endeavored not to be deceived by size or flesh. For beef they deem others better, but for hardiness, milk and cream they cannot commend these too highly. They rejoice at the evidence given by this largest show of Ayrshires ever made by the Society, that these characteristics are being more and more appreciated.

C. T. Hulburd, *Brasher Falls, N. Y.*
E. P. Prentice, *Albany, N. Y.*

No. 5. Jerseys.

JERSEY HERD PRIZE.

Thomas J. Hand, Sing Sing, N. Y., Large Gold Medal.

Bull, "Tancred;"

French gray, calved on voyage, landed April 15, 1870; sired in Jersey, dam Velvet, imported form Jersey.

Bull, "Euclid;"

Dark gray, calved August 28, 1870, bred by exhibitor; sire Lawrence 61, dam Gold-drop bred by A. LeGallais, in Jersey.

Cow, "Lady Mary;"

Gray, calved in 1866, imported from Jersey.

Cow, "Emblem;"

Calved February 1868, bred by E. Gibaut in Jersey; sire Clement 115.

Heifer, "Zenith;"

Light cinnamon fawn, calved May 2, 1870, bred by exhibitor; sire Southampton 117, dam Emblem (imp.) by Clement 115.

Heifer, "Witch Hazel;"

Fawn, calved April 28, 1870, bred by exhibitor; sire Southampton 117, dam Hazel by Clement 115, g. d. Lady-bird, imported from Jersey.

Heifer, "Emily Hampton;"

Brown, calved July 11, 1871, bred by exhibitor; sire Southampton 117, dam Emblem, imported from Jersey.

Bulls Over Three Years Old.

First prize, W. B. Dinsmore, Staatsburgh, N. Y.; Hector, brown, calved July, 1868, imported by exhibitor, August, 1870.......... $30

Second, William M. Holmes, Greenwich, N. Y.; black, calved April, 1868, bred by William Wymett; sire Blucher, dam cow from J. O. Sheldon's herd.... 20

Third, Peter Van Wie, Bethlehem, N. Y.; fawn, calved April, 1868, bred by E. Corning, Jr., Albany, N. Y.; sire Romeo, dam Lady Eva, imported by Daniel Deshon, Waverly, Mass. 10

Bulls Two Years Old.

First prize, E. Corning, Jr., Albany, N. Y.; Butler, fawn and white, calved May, 1869, bred by exhibitor; sire Romeo, dam Lady Eva, imported by Daniel Deshon, of Waverly, Mass...................... $30

Second, W. B. Dinsmore, Staatsburgh, N. Y.; Emperor, gray, calved December 1, 1868, bred by exhibitor; sire Jerry 15, dam Eve 2d, sired in Jersey, gr. d. Eve (imp.)..... 20

Third, Thomas H. Faile, Jr., New York; Mercury, black, calved April 7, 1869, bred by R. M. Hoe, New York; sire Jupiter 93, dam Alphea by Saturn 94, gr. d. Rhea (imp.)............................. 10

Yearling Bulls.

First prize, Thomas J. Hand, Sing Sing, N. Y.; Tancred, French gray, calved on voyage, landed April 15, 1870; sired in Jersey, dam Velvet, imported from Jersey........ 25

Second, Joseph Juliand, Bainbridge, N. Y.; Rubric, dark fawn, brown and gray, calved February 19, 1870, bred by T. J. Hand, Sing Sing, N. Y.; sire Lawrence 61, dam Motto by Prince 55, gr. d. Ophir by Prince 55 15

Third, W. B. Dinsmore, Staatsburgh, N. Y.; Governor, brown, calved October 19, 1869, bred by exhibitor; sire Napoleon 291, dam Gracie (imp.)........................ 10

Bull Calves.

First prize, Edwin Thorne, Millbrook, N. Y.; Blackwood, black and tan, calved January 26, 1871, bred by exhibitor; sire Ontario, dam Fanny by General 107, gr. d. Flora (imp.)............................. 20

Second, Thomas H. Faile, Jr., New York; Onondio, probably dark gray, calved March 29, 1871, bred by exhibitor; sire Southampton 117, dam Edith 3d by Jupiter 93, gr. d. Edith (imp.) 10

Third, Thomas J. Hand, Sing Sing, N. Y.; Marius, gray, calved April 23, 1871, bred by exhibitor; sire Willie Boy 434, dam Lady Mary, imported from Jersey..Commended

Cows Over Three Years Old.

First prize, Thomas H. Faile, Jr., New York; Edna, silver gray, calved March 6, 1859, bred by John A. Taintor, Hartford, Conn.; sire Taintor's bull of 1858, 306, dam Thorne's imported Flora......... 30

Second, Thomas J. Hand, Sing Sing, N. Y.; Emblem, gray, calved February, 1868, bred by E. Gibaut, in Jersey; sire Clement 115, 20

Third, Thomas H. Faile, Jr., New York; Flora 2d, squirrel gray, calved July 18, 1862, bred by John Haven, Fort Washington, N. Y.; sire General 107, dam Flora (Thorne's) 10

Heifers Two Years Old

First prize, Thomas H. Faile, Jr., New York; Edith 4th, gray with some white, calved May 1, 1869, bred by exhibitor; sire Mars 95, dam Edith 3d by Jupiter 93, gr. d. Edith (imp.)......................... $30

Second, Thomas H. Faile, Jr., New York; Topsy 3d, gray with some white, calved January 3, 1869, bred by exhibitor; sire Jupiter 93, dam Topsy (imp.)........... 20

Third, W. B. Dinsmore, Staatsburgh, N. Y.; Phœbe 3d, brown, calved September 1, 1869, bred by exhibitor; sire Napoleon 291, dam Phœbe (imp.) 10

Yearling Heifers.

First prize, Thomas H. Faile, Jr., New York; Young Edith, dark brown, calved April 19, 1870, bred by exhibitor; sire Southampton 117, dam Edith (imp.).................. 25

Second, W. B. Dinsmore, Staatsburgh, N. Y.; Gipsy 5th, fawn, calved April 1, 1870, bred by exhibitor; sire Napoleon 291, dam Gipsy 15

Third, Thomas J. Hand, Sing Sing, N. Y.; Zenith, light cinnamon fawn, calved May 2, 1870, bred by exhibitor; sire Southampton 117, dam Emblem (imp.) by Clement 115 10

Heifer Calves.

First prize, Thomas J. Hand, Sing Sing, N. Y.; Emily Hampton, brown, calved July 11, 1871, bred by exhibitor; sire Southampton 117, dam Emblem, imported from Jersey.. 20

Second, W. B. Dinsmore, Staatsburgh, N. Y.; Rose 3d, dark fawn, calved April 16, 1871, bred by exhibitor; sire Napoleon 291, dam Rose 10

John Haven, *New York*,
C. I. Hayes, *Unadilla, N. Y.*

No. 6. Milch Cows, etc.

Milch Cows.

First prize, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Ayrshire 30

Second, John Stryker, Rome, N. Y.; Mary, roan, calved March 22, 1867, bred by exhibitor; sire Second Duke of Plymouth (Short Horn), dam Mary 1st; date of calving March 20, 1871 20

Third, William H. Slingerland, Albany, N. Y.; Cream Pot 9th, red and white, calved September 12, 1862, bred by exhibitor; breed short horn; date of calving April 26, 1871 10

Grade Short Horn Cows and Heifers.

First prize, O. Howland, Auburn, N. Y.; Rose, red and white, 8 years old, bred by William Daniels; sire Short Horn, breed of dam unknown......................... 20

Second, David K. Bell, West Brighton, N. Y.; Lady Darling, red and white, calved May

6th, 1864, bred by Joseph Williams, West Henrietta, N. Y.; sire Short Horn, dam grade Short Horn..................... $15

Third, Robert Bell, West Brighton, N. Y.; Lily May, red and white, calved June 2, 1868, bred by exhibitor; sire Major Jack Downing (Short Horn), dam Kate (grade Short Horn)............................... 10

GRADE AYRSHIRE COWS AND HEIFERS.

First prize, O. Howland, Auburn, N. Y.; Lily, white and red, calved May 10, 1867, bred by exhibitor; sire Jasper (Ayrshire), dam Rose (grade Short Horn)............... 20

Second, F. D. Curtis, Charlton, N. Y.; red and white, calved April 20, 1870, bred by exhibitor; sire Doon 2d (Ayrshire), dam Marion (three-fourths Ayrshire), bred by James Thompson..................... 15

GRADE JERSEY COWS AND HEIFERS.

First prize, William L. Learned, Albany, N. Y.; grade Alderney, 5 months old 20

No. 7.—OXEN, STEERS AND FAT CATTLE.

WORKING OXEN OVER FIVE YEARS OLD.

First prize, Joseph Hilton, New Scotland, N. Y; grade Devons 20

WORKING OXEN OVER FOUR YEARS OLD.

First prize, Edmund Crawford, New Scotland, N. Y................................ 20

Second, J. Juliand, Bainbridge, N. Y.; grade Devons, deep red 15

STEERS THREE YEARS OLD.

First prize, C. H. Jewell, Westville, N. Y.; dark red 20

Second, Edmund Crawford, New Scotland, N. Y.; red............................. 15

FAT OXEN OVER FOUR YEARS OLD.

First prize, Frederick J. Woodworth, West Farmington, N. Y..................... 20

FAT STEERS THREE YEARS OLD OR UNDER.

First prize, Ebenezer Adams, Ghent, N. Y.... 20

FAT COWS OVER FOUR YEARS OLD.

First prize, O. Howland, Auburn, N. Y....... 20

FAT HEIFERS THREE YEARS OLD OR UNDER.

Firse prize, O. Howland, Auburn, N. Y 20

The exhibition of working cattle was not large, but was very fine. There were only a few milch cows exhibited, but they were good.

Your committee feel that for this great dairy State, this department is too much neglected.

J. H. GRAHAM, *Delhi*.
S. G. SMITH, *Mechanicsville, N. Y.*

CLASS II.—HORSES.

No. 8.—BREEDING AND GROWING STOCK.

STALLIONS FOR GENERAL PURPOSES, EACH TO BE ACCOMPANIED BY NOT LESS THAN FIVE OF HIS PRODUCE, ONE YEAR OLD OR OVER; THE MERITS OF BOTH SIRE AND PRODUCE TO BE CONSIDERED.

First prize, Alden Goldsmith, Blooming Grove, N. Y.; Volunteer, bay, 15.3, 15 years; by Rysdyk's Hambletonian, dam by Young Patriot ....Large Gold Medal.

Second, E. N. Thomas, Rose, N. Y.; Crittenden Jr., bay, 15.3, 6 years; by John J. Crittenden, dam by Abdallah $30

Third, D. B. Haight, Dover Plains, N. Y.; Goldsmith, dark day, 15.3, 8 years; by Rysdyk's Hambletonian, dam by imported Trustee ....Commended.

DRAUGHT STALLIONS OVER FIVE YEARS OLD.

First prize, John B. Young, Syracuse, N. Y.; Robin Hood Jr., brown, 17, 7 years, bred by J. Powley, Waterloo, Kingston, C. W.; by Robin Hood, dam by Anglo Saxon.... 30

DRAUGHT STALLIONS UNDER FIVE AND OVER THREE YEARS OLD.

First prizé, John B. Vrooman, Fonda, N Y.; brown roan, 16½, 4 years................ $25

CARRIAGE STALLIONS OVER FIVE YEARS OLD AND NOT LESS THAN FIFTEEN HANDS THREE INCHES HIGH.

First prize, Alden Goldsmith, Blooming Grove, N. Y.; Abdallah, bay, 15.3½, 8 years; by Volunteer, dam Martha by Old Abdallah.. $30

Second, Alden Goldsmith, Blooming Grove, N. Y.; Woburn, brown, 16, 8 years; by Rysdyk's Hambletonian, dam by Telegraph, gr. d. by Friday 20

CARRIAGE STALLIONS UNDER FIVE AND OVER THREE YEARS OLD.

First prize, Heber Van Valkenburgh, Malden Bridge, N. Y.; Empire State, bay, 16½, 4 years, bred by exhibitor; by Mambrino, dam Lady Jackson by Campbell Jackson...... $25

Second, D. B. Haight, Dover Plains, N. Y.; mahogany bay, 15.3, 3 years; by a son of Henry Clay, dam by George M. Patchen, 15

CARRIAGE STALLIONS UNDER THREE YEARS OLD.

First prize, E. N. Thomas, Rose, N. Y.; bright bay, 2 years; by Crittenden Jr., dam Pauline (dam of Angeline and Experiment)... $20

Second, D. B. Haight, Dover Plains, N. Y.; Wm. Penn, brown, 15.3, 2 years; by Goldsmith, dam Dolly by Jupiter, gr. d. by Old Abdallah, g. gr. d. by Young Engineer ... 10

Third, John Stryker, Rome, N. Y.; brown, 15½, 2 years; by Messenger, dam Black Hawk, Commended.

CARRIAGE MARES 15 HANDS 3 INCHES OR OVER, WITH FOALS AT FOOT.

First prize, Charles H. Lathrop, Albany, N. Y.;

Kentucky Maid, bay, 16, 9 years; by Mambrunello, dam Bird by Commodore, gr. d. by Gray Eagle; foal at foot by Hamlet ... $30

Second, Ira Harris, Loudonville, N. Y.; Virginia, black, 16, 11 years, bred in Shenandoah Valley, Va.; foal at foot by Hambletonian stallion, owned by Charles Stanford, Schenectady, N. Y. 20

CARRIAGE FILLIES UNDER FIVE AND OVER THREE YEARS OLD.

First prize, Alden Goldsmith, Blooming Grove, N. Y.; chestnut, 3 years; by Woburn, dam by Consternation, gr. d. by Balrownie.... $25

CARRIAGE FILLIES UNDER THREE YEARS OLD.

First prize, E. N. Thomas, Rose, N. Y.; bay, 1 year; by Crittenden, Jr., dam by Felton's (son of Hill's) Black Hawk, gr. d. by Miller Horse 20

ROADSTER STALLIONS FIVE YEARS OLD OR OVER.

First prize, Edwin Thorne, Millbrook, N. Y.; Thorndale, bay, 6 years; by Alexander's Abdallah, dam by Mambrino Chief, gr. d. by a son of Potomac $30

Second, M. E. Williams, Chatham Village, N. Y.; Berkshire Boy, bay, 15½, 6 years; by Goodrich's Rattler, dam Lady Agnes by Rysdyk's Hambletonian 20

Third, R. M. Carpenter, Troy, N. Y.; Young Hambletonian, bay, 15.2, 6 years .Commended.

ROADSTER STALLIONS UNDER FIVE AND OVER THREE YEARS OLD.

First prize, J. S. Edsall, Goshen, N. Y.; Fleetwood, bay, 15.2, 3 years; by Happy Medium, dam by Vernol's Black Hawk, gr. d. by Patten's Bellfounder $25

Second, Edwin Thorne, Millbrook, N. Y.; Cavalier, brown, 3 years; by Hamlet, dam by Wadsworth's Henry Clay.............. 15

ROADSTER STALLIONS UNDER THREE YEARS OLD.

First prize, Robert Knapp, Westchester, N. Y.; Lothair, chestnut, 1 year; by Goldsmith, dam Minnie Myrtle by Kemble Jackson... $20

Second, John D. Wing, Washington, N. Y.; Left Bower, brown, foaled fall of 1869; sire Manhattan, dam of Black Hawk and Messenger blood..................... 10

ROADSTER MARES FIFTEEN HANDS THREE INCHES, AND NOT LESS THAN FOURTEEN HANDS THREE INCHES, WITH FOALS AT FOOT.

First prize, Dean Sage, Albany, N. Y.; chestnut mare, 15.1, 6 years; by Carpenter Star (by American Star), dam by Telegraph, gr. d. by Hector; with bay colt foal at foot, 5 months old, by Aberdeen $30

Second, D. B. Haight, Dover Plains, N. Y.; Kitty Carson, under 15.2, with colt at foot by Goldsmith 20

Third, George S. Haggart, Fonda, N. Y.; Nelly, bay, 7 years, with foal, Lady, by Arcola.. Commended.

ROADSTER FILLIES UNDER FIVE AND OVER THREE YEARS OLD.

First prize, Alden Goldsmith, Blooming Grove, N. Y.; bay, 4 years; by Volunteer, dam by American Star, gr. d. an imported thoroughbred mare $25

Second, Alden Goldsmith, Blooming Grove, N. Y.; bay, 3 years; by Volunteer, dam by Washington......................... 15

Third, William D. Hilton, Providence, R. I.; black, 3 years; by Goldsmith, dam Dolly by Jupiter, gr. d. by Abdallah....Commended.

ROADSTER FILLIES UNDER THREE YEARS.

First prize, William D. Hilton, Providence, R. I.; Colleen, chestnut, 2 years; by Goldsmith, dam by Taggart's Abdallah, gr. d. thoroughbred 20

Second, E. N. Thomas, Rose, N. Y.; bay, 2 years; by Crittenden, Jr., dam Julia by Ethan Allen, gr. d. Quickstep by Dan Crocket 10

Third, John Young, Syracuse, N. Y.; Rosa, chestnut, 2 years; by Young Lysander ... Commended.

C. C. BRADLEY, JR., *Syracuse, N. Y.*
P. C. KELLOGG, *New York.*

No. 9. WORK HORSES.

DRAUGHT HORSES WEIGHING OVER 2500 POUNDS THE PAIR.

First prize, Dodge & Stevenson, Manufacturing Co., Auburn, N. Y.; bays, 16, 10 years .. $20

FARM OR TEAM HORSES WEIGHING LESS THAN 2500 POUNDS AND OVER 2000 POUNDS THE PAIR.

First prize, N. B. Mann, Mannsville, N. Y.... $20

Second, Rensselaer Lasher, Bethlehem, N. Y.; bays, 16............................ 10

PAIRS OF CARRIAGE HORSES OVER SIXTEEN HANDS AND WEIGHING NOT LESS THAN 2400 POUNDS.

First prize, H. S. Bennet, Ridgway, N. Y.; bay geldings, 16.2, 5 years.................. $20

PAIRS OF CARRIAGE HORSES 15.3, AND NOT OVER SIXTEEN HANDS ONE INCH.

First prize, Rufus M. Remington, Auburn, N. N.; Y.; brown geldings, 16, 5 years; Consternation stock $20

Second, T. C. Rider, Chatham, N. Y.; bays, 15.3½, 6 years.......................... 10

CARRIAGE HORSES 15 TO 15.3.

First prize, S. H. Ellsworth, Starkville, N. Y.; brown mares, 15.2, 5 years............. 20

Second, Elias Milbank, Albany, N. Y.; bay geldings, 15.3, 6 and 7 years 10

SINGLE HARNESS HORSES 15.3 OR OVER.

First prize, Elias Milbank, Albany, N. Y.; bay mare, 16, 7 years....................... 10

Second, George Hosington, Belleville, N. Y.; gelding, 15.3 5

SINGLE HARNESS HORSES UNDER 15.3 AND NOT LESS THAN 15 HANDS.

First prize, Edwin Thorne, Millbrook, N. Y.; Tactics, 5 years; by Hamlet, dam by Rysdyk's Hambletonian $10

Second, Dean Sage, Albany, N. Y.; bay gelding, 15.1½, 6 years, by Rysdyk's Hambletonian, dam by American Star........... 5

SADDLE HORSES 14.3 AND LESS THAN 15.2.

First prize, H. Bowen, Medina, N. Y.; Billy, by Young Consternation; brown, 15.1, 4 years 10

Second, J. P. Levy, Ridgway, N. Y. 5

SADDLE HORSES 14 AND LESS THAN 14.3.

First prize, Howard K. Payn, Albany, N. Y.; Charley, dark brown gelding, 14, 8 years. 10

JACKS.

First prize, C. W. Briggs, Durhamville, N. Y.; Kentucky Chief, black, 15, 4 years, bred by Frank Bradshaw, Sharpsburgh, Ky. 15

PAIRS OF MULES UNDER 15.3.

First prize, George Cary, Albany, N. Y.; dun and bay, 15, 9 years..................... 20

We also noticed a number of fine pairs and single horses for exhibition only.

A. B. RAYMOND, *New York*,
E. N. THOMAS, *Rose*, *N. Y.*

CLASS III.—SHEEP, SWINE AND POULTRY.

No. 12. LONG-WOOLED SHEEP.

LEICESTER RAMS OVER TWO YEARS.

First prize, Jurian Winne, Bethlehem, N. Y... $15

LEICESTER RAMS UNDER TWO YEARS.

First prize, Jurian Winne, Bethlehem, N. Y... 15

LEICESTER EWES OVER TWO YEARS.

First prize, George Ingersoll, Charleston, N. Y. 15

PENS OF (3) LEICESTER EWES UNDER TWO YEARS.

First prize, George Ingersoll, Charleston, N. Y. 15

COTSWOLD RAMS OVER TWO YEARS OLD.

First prize, G. F. Mills, Fonda, N. Y. 15

Second, Chase & Harris, Rochester, N. Y. 10

Third, Chase & Harris, Rochester, N. Y...... 5

COTSWOLD RAMS UNDER TWO YEARS.

First prize, Jacob Albright, Etna, N. Y....... 15

Second, Samuel H. Brown, Millbrook, N. Y... 10

Third, Jacob Albright, Etna, N. Y............ 5

COTSWOLD RAM LAMBS.

First prize, George Ingersoll, Charleston, N. Y. 10

Second, Chase & Harris, Rochester, N. Y...... 5

PENS OF (3) COTSWOLD EWES OVER TWO YEARS.

First prize, Chase & Harris, Rochester, N. Y.. $15

PENS OF (3) COTSWOLD EWES UNDER TWO YEARS OLD.

First prize, Chase & Harris, Rochester, N. Y.. $15

PENS OF (3) COTSWOLD EWE LAMBS.

First prize, George Ingersoll, Charleston, N. Y. 10

LINCOLN RAMS OVER TWO YEARS OLD.

First prize, Walcott & Campbell, New York Mills, N. Y. 15

LINCOLN RAMS UNDER TWO YEARS.

First prize, Walcott & Campbell, New York Mills, N. Y.......................... 15

PENS OF (3) LINCOLN EWES OVER TWO YEARS OLD.

First prize, Walcott & Campbell, New York Mills, N. Y.......................... 15

PENS OF (3) LINCOLN EWES UNDER TWO YEARS OLD.

First prize, Walcott & Campbell, New York Mills, N. Y.......................... 15

Your judges would call particular attention to the two splendid Cotswold Rams, Washington and Viceroy, bred and exhibited by Mr. Sherman Hartwell, of Washington, Connecticut; which, by the rules of the Society, were debarred from competing for premiums. Mr. Hartwell has shown great judgment in selecting and great skill in breeding, to produce such splendid animals.

JOHN PURVES, *Madrid*, *N. Y.*
JOHN BANKS, *Bainbridge*, *N. Y.*

No. 13. MIDDLE WOOLED SHEEP.

SOUTH DOWN RAMS OVER TWO YEARS.

First prize, George H. Brown, Millbrook, N. Y. $15

Second, George H. Brown, Millbrook, N. Y.... 10

Third, George Van Derveer, Port Jackson, N. Y. 5

SOUTH DOWN RAMS UNDER TWO YEARS.

First prize, George H. Brown, Millbrook, N. Y. 15

Second, D. B. Haight, Dover Plains, N. Y.... 10

Third, D. B. Haight, Dover Plains, N. Y...... 5

PENS OF (3) SOUTH DOWN RAM LAMBS.

First prize, George H. Brown, Millbrook, N. Y., 10

Second, D. B. Haight, Dover Plains, N. Y..... 5

PENS OF (3) SOUTH DOWN EWES OVER TWO YEARS OLD.

First prize, Geo. H. Brown, Millbrook, N. Y.. 15

Second, Geo. H. Brown, Millbrook, N. Y..... 10

Third, D. B. Haight, Dover Plains, N. Y...... 5

PENS OF (3) SOUTH DOWN EWES UNDER TWO YEARS OLD.

First prize, Geo. H. Brown, Millbrook, N. Y.. 15

Second, Geo. H. Brown, Millbrook, N. Y..... 10

Third, D. B. Haight, Dover Plains, N. Y...... 5

PENS OF (3) SOUTH DOWN EWE LAMBS.

First prize, D. B Haight, Dover Plains, N. Y.. $10

Second, Joseph Juliand, Bainbridge, N. Y..... 5

The judges are informed that the Shropshire Down Sheep of L. C. & E. Fish were not regularly entered for competition. Still they would recommend a second premium of $10 be awarded them for the ram over two years old, and a first premium of $15 for the pen of three ewes over two years old.

J. McD. McINTYRE, *Linlithgo, N. Y.*
ALEXANDER MABLE, *Delhi, N. Y.*

No. 14. CLASS A.—MERINOS BREED SPECIALLY FOR FINENESS OF WOOL.

RAMS OVER TWO YEARS OLD.

First prize, William Chamberlain, Red Hook, N. Y. $15

Second, Carl Heyne, Red Hook, N. Y......... 10

Third, William Chamberlain, Red Hook, N. Y., 5

RAMS UNDER TWO YEARS.

First prize, Carl Heyne, Red Hook, N. Y..... 15

Second, William Chamberlain, Red Hook, N. Y., 10

Third, William Chamberlain, Red Hook, N. Y., 5

PENS OF (3) RAM LAMBS.

First prize, Carl Heyne, Red Hook, N. Y..... 10

Second, Wm. Chamberlain, Red Hook, N. Y.. 5

PENS OF (3) EWES OVER TWO YEARS OLD.

First prize, William Chamberlain, Red Hook, N. Y.... 15

Second, Wm. Chamberlain, Red Hook, N. Y.. 10

Third, Carl Heyne, Red Hook, N. Y.......... 5

PENS OF (3) EWES ONE YEAR OLD.

First prize, Carl Heyne, Red Hook, N. Y...... 15

Second, Wm. Chamberlain, Red Hook, N. Y... 10

Third, Wm. Chamberlain, Red Hook, N. Y.... 5

PENS OF (3) EWE LAMBS.

First prize, William Chamberlain, Red Hook, N. Y.... 10

Second, Carl Heyne, Red Hook, N. Y......... 5

No. 14. CLASS B.—MERINOS BREED SPECIALLY FOR WEIGHT OF FLEECE.

RAMS OVER TWO YEARS OLD.

Second prize, William Chamberlain, Red Hook, N. Y.... $10

RAMS UNDER TWO YEARS OLD.

First prize, William Chamberlain, Red Hook, N. Y.... 15

PENS OF (3) LAMB RAMS.

Second prize, J. Oscar Joslin, Buskirk's Bridge, N. Y.... 5

PENS OF (3) EWES OVER TWO YEARS OLD.

Second prize, William Chamberlain, Red Hook, N. Y.... 10

PENS OF (3) EWE LAMBS.

Second prize, J. Oscar Joslin, Buskirk's Bridge, N. Y.... $5

The committee on No. 14, Class A and B, take the liberty to remark that in Class A they find an exhibition of extraordinary merit as to fineness and compactness of fleece. But as to the lambs exhibited they were unable to judge with any degree of accuracy, because they had been recently shorn, and they would recommend that hereafter lambs shown for competition, in this class, must not be shorn.

ELON PERCEY, *Hoosick Falls, N. Y.*
WILLIAM M. HOLMES, *Greenwich, N. Y.*

No. 15. SWINE.

LARGE WHITE BREED.

BOARS OVER TWO YEARS OLD.

First prize, McLean & Mather, Belleville, N. Y., $15

Second, A. L. Thomas, Cuba, N. Y 10

BOARS ONE YEAR OLD.

First prize, Clark & Green, Belleville, N. Y.... 15

Second, A. L. Thomas, Cuba, N. Y........... 10

BOARS SIX MONTHS OLD AND LESS THAN ONE YEAR.

First prize, A. L. Thomas, Cuba, N. Y....... $15

Second, Clark & Green, Belleville, N. Y....... 10

BREEDING SOWS OVER TWO YEARS OLD.

First prize, McLean & Mather, Belleville, N. Y., 15

Second, Clark & Green, Belleville, N. Y...... 10

SOWS ONE YEAR OLD.

First prize, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.... 15

Second, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.... 10

SOW PIGS OVER SIX MONTHS.

First prize, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.... 15

Second, Clark & Green, Belleville, N. Y....... 10

PENS OF (5) PIGS UNDER SIX MONTHS OLD.

First prize, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.... 15

Second, Clark & Green, Belleville, N. Y....... 10

SMALL WHITE BREED.

BOARS SIX MONTHS OLD AND LESS THAN ONE YEAR.

First prize, A. L. Thomas, Cuba, N. Y........ 15

Second, F. D. Curtis, Charlton, N. Y......... 10

PENS OF (5) PIGS UNDER SIX MONTHS.

First prize, A. L. Thomas, Cuba, N. Y........ 15

Second, A. L. Thomas, Cuba, N. Y........... 10

Your committee would report in this class a grand show of first class stock, creditable alike to the breeders and to the stock of swine in the Empire State.

D. VAN ALLEN, *Adamsville, N. Y.*
J. G. HALL, *Argyle, N. Y.*

Small Black Breed.

Boars One Year Old.

First prize, Sam'l H. Brown, Millbrook, N. Y.. $15
Second, Joseph Harris, Rochester, N. Y. 10

Boars six Months old and less than One Year.

First prize, Joseph Harris, Rochester, N. Y.... 15

Breeding Sows over Two Years Old.

First prize, Joseph Harris, Rochester, N. Y... 15
Second, Joseph Harris, Rochester, N. Y....... 10

Sows One Year Old.

First prize, Sam'l H. Brown, Millbrook, N. Y.. 15
Second, Joseph Harris, Rochester, N. Y...... 10

Sow Pigs over six Months old and less than One Year.

First prize, Joseph Harris, Rochester, N. Y... 15
Second, Joseph Harris, Rochester, N. Y 10

Pens of (5) Pigs under Six Months.

First prize, Joseph Harris, Rochester, N. Y.... 15
Second, Joseph Harris, Rochester, N. Y...... 10

Berkshires.

Boars One Year Old.

First prize, D. B. Haight, Dover Plains, N. Y.. 15

Boars six Months old and less than One Year.

First prize, F. D. Curtis, Charlton, N. Y...... 15
Second, Joseph Juliand, Bainbridge, N. Y 10

Breeding Sows over Two Years Old.

First prize, Sam'l H. Brown, Millbrook, N. Y.. 15

Sows One Year Old.

First prize, Sam'l H. Brown, Millbrook, N. Y.. 15
Second, Samuel H. Brown, Millbrook, N. Y... 10

Sow Pigs over six Months old and less than One Year.

First prize, F. D. Curtis, Charlton, N. Y...... 15
Second, D. B. Haight, Dover Plains, N. Y..... 10

Pens of (5) Pigs under Six Months.

First prize, D. B. Haight, Dover Plains, N. Y.. 15
Second, Samuel H. Brown, Millbrook, N. Y... 10

Berkshire Boars under Six Months.

Samuel H. Brown, Millbrook, N. Y....Commended.
Samuel H. Brown, Millbrook, N. Y....Commended.

J. Ashworth, *Ottawa, Canada,*
D Griffin, *Saratoga Springs, N. Y.*
S. T. Deuel, *Little Rest, N. Y.*

No. 16. Poultry.

Trios Gray Dorkings.

First prize, R. P. Wolcott, Holland Patent, N. Y.................................. $5
Second, J. Y. Bicknell, Westmoreland, N. Y... 3

Trios White Dorkings.

First prize, J. Y. Bicknell, Westmoreland, N.Y., 5
Second, G. H. Warner, New York Mills, N. Y., 3

Trios Black Spanish.

Second prize, O. Howland, Auburn, N. Y..... $3

Trios White Polands.

First prize, E. G. Studley, Claverack, N. Y.... 5
Second, E. G. Studley, Claverack, N. Y....... 3

Trios Golden Polands.

Second prize, J. Y. Bicknell, Westmoreland, N. Y.................................. 3

Trios Silver Polands.

First prize, William R. Hills, Albany, N. Y... 5
Second, William R. Hills, Albany, N. Y....... 3

Trios Bolton Grays.

First prize, Robert Bell, West Brighton, N. Y.. 5

Trios Black Breasted Red Games.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5
Second, J. Y. Bicknell, Westmoreland, N. Y .. 3

Trios other Red Games.

First prize, Isabel Cattle, New York Mills, N. Y. 5
Second, J. Y. Bicknell, Westmoreland, N. Y .. 3

Trios Gray Duck-winged Games.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5
Second, D. L. Stage & Co., Schenectady, N. Y. 3

Trios Pile Games.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5
Second, D. L. Stage & Co., Schenectady, N. Y. 3

Trios Leghorns.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5
Second, D. L. Stage & Co., Schenectady, N. Y. 3

Trios African Bantams.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5

Trios Gold-laced Bantams.

First prize, William R. Hills, Albany, N. Y... 5
Second, William R. Hills, Albany, N. Y....... 3

Trios Silver-laced Bantams.

First prize, William R. Hills, Albany, N. Y... 5

Trios Buff Cochins.

First prize, L. C. Gardner, Fayetteville, N. Y.. 5
Second, G. H. Warner, New York Mills, N. Y. 3

Trios White Cochins.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5

Trios Partridge Cochins.

First prize, G. H. Warner, New York Mills, N. Y.................................. 5
Second, D. L. Stage & Co., Schenectady, N. Y. 3

Trios Light Brahmas.

First prize, E. G. Studley, Claverack, N. Y.... 5
Second, J. Y. Bicknell, Westmoreland, N. Y .. 3

Trios Dark Brahmas.

First prize, G. H. Warner, New York Mills, N. Y.................................. 5
Second, E. P. Howlett, Syracuse, N. Y 3

TRIOS SILVER HAMBURGHS.

First prize, William R. Hills, Albany, N. Y... $5
Second, J. Y. Bicknell, Westmoreland, N. Y.. 3

BLACK HAMBURGHS.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5

TRIOS GOLDEN HAMBURGHS.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5
Second, William R. Hills, Albany, N. Y 3

TRIOS HOUDANS.

First prize, E. G. Studley, Claverack, N. Y ... 5
Second, G. H. Warner, New York Mills, N. Y. 3

TRIOS CREVE-COEURS,

First prize, William R. Hills, Albany, N. Y ... 5

TRIOS LA FLECHE.

First prize, G. H. Warner, New York Mills, N. Y................................ 5
Second, J. Y. Bicknell, Westmoreland, N. Y.. 3

PAIRS OF BRONZE TURKEYS.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5
Second, J. M. Rockwell, Butternuts, N. Y ... 3

PAIRS OF COMMON BLACK OR BROWN TURKEYS.

First prize, O. Howland, Auburn, N. Y....... 5

PAIRS OF WHITE TURKEYS.

First prize, O. Howland, Auburn, N. Y....... 5

PAIRS OF MUSCOVY DUCKS.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5
Second. J. Y. Bicknell, Westmoreland, N. Y... 3

PAIRS OF AYLESBURY DUCKS.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5
Second, G. H. Warner, New York Mills, N. Y. 3

PAIRS OF ROUEN DUCKS.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5
Second, J. Y. Bicknell, Westmoreland, N. Y... 3

PAIRS OF CAYUGA DUCKS.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5
Second, R. P. Wolcott, Holland Patent, N. Y.. 3

PAIRS OF BREMEN GEESE.

First prize, Peter Van Wie, Bethlehem, N. Y... 5
Second, O. Howland, Auburn, N. Y........... 3

PAIRS OF WHITE CHINA GEESE.

First prize, Peter Van Wie, Bethlehem, N. Y.. 5

PAIRS OF AFRICAN GEESE.

Second prize, E. A. Wendell, Albany, N. Y.... 3

PAIRS OF WILD GEESE.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5
Second, E. A. Wendell, Albany, N. Y. 3

PAIRS OF GUINEA FOWLS.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5

PAIRS OF COMMON RABBITS.

First prize, Melville A. Harris, Albany, N. Y... 3
Second, E. J. Wendell, Albany, N. Y......... 2

EXTRA AWARDS.

TRIOS BLACK RED GAME BANTAMS.

First prize, G. H. Warner, New York Mills, N. Y................................ $5
Second, E. P. Howlett, Syracuse, N. Y........ 3

DUCK WING GAME BANTAMS.

First prize, G. H. Warner, New York Mills, N. Y................................ 5
Second, D. L. Stage & Co., Schenectady, N. Y. 3

DOMINIQUES.

First prize, J. Y. Bicknell, Westmoreland, N. Y. 5
Second, E. G. Studley, Claverack, N. Y. 3

COLLECTION OF EGGS.

J. Y. Bicknell, Westmoreland, N. Y...Commended.

DEVICE FOR WATERING FOWLS.

J. Y. Bicknell, Westmoreland, N. Y.......... Highly commended.

COOP FOR HEN AND CHICKENS.

H. O. Pratt, Clark's Mills. N. Y......Commended.

PRACTICAL EXHIBITION COOP FOR FOWLS.

H. O. Pratt, Clark's Mills, N. Y......Commended.

PATENT EGG CARRIER.

D. W. Seely, Cedar Hill, N. Y........Commended.

PORTABLE FOLDING COOP.

D. L. Stage & Co., Schenectady, N. Y......... Highly commended..

RUSSIAN BLOODHOUND.

William Schindler, Albany, N. Y......Commended.

ISAAC VAN WINKLE, *Greenville, N. J.*
GEORGE TWEDDLE, *Albany, N. Y.*

CLASS IV.—IMPLEMENTS AND MACHINERY.

No. 17. IMPLEMENTS AND MACHINES. FIRST LIST.

STATIONARY STEAM ENGINES.

Townsend & Jackson, Albany, N. Y.; sixty horse power stationary engine, 12-inch bore, 24-inch stroke, bed-plate, pillow block and slides cast in one piece, and made extra strong for running at the rate of 125 revolutions a minute to develop power; valve and piston rods made of steel, crank of disk form; all bright parts highly polished, $2,000......................Bronze Medal.

Skinner & Arnold, Albany, N. Y.; vertical steam engine and boiler, 5-inch bore, 12-inch stroke, 6 horse power, $600............. Certificate of Merit.

PORTABLE STEAM ENGINES.

Aveling & Porter, Rochester and London, England; road or farm locomotive, 5 tons, 10 cwt., $3,000 gold...........Bronze Medal.

NOTE.—*Premiums for the other machines, usually embraced in this list, were not offered this year, no field trials being had.*

EXTRA AWARDS.

Sessions & Knox, Worcester, Mass.; patent steel for ploughs .... Bronze Medal.

Frank Ellicott, Medina, N. Y.; Dailey's patent self-adjusting plough holder............. Certificate of Merit.

J. J. Thomas & Co., Geneva, N. Y.; Thomas' smoothing harrow .... Certificate of Merit.

Empire Windmill Manufacturing Company, Syracuse, N. Y.; Empire self-regulating windmill, $175................ Bronze Medal.

Empire Windmill Manufacturing Company, Syracuse, N. Y.; E. H. Bancroft's patent rotary attachment for the Empire windmill .... Certificate of Merit.

Nathan P. Chaney, Potsdam, N. Y.; Manley's improved land roller, $65 ...... Bronze Medal.

C. C. Bradley & Son, Syracuse, N. Y.; Carhart's pulverizing cultivator, $20 .... Certificate of Highest Merit.

Sprague Mowing Machine Co., Providence, R. I.; hitching attachment for mowers.......... Certificate of Highest Merit.

Bay State Horse Rake Co., Winchendon, Mass.; for improvement in Bay State horse rake, Certificate of Merit.

J. M. Hanford, Middletown, N. Y.; wheel horse rake for gathering hay and gleaning stubble, Certificate of Merit.

J. C. Stoddard, Chicopee Falls, Mass.; Stoddard's balance rake with independent teeth, Certificate of Merit.

American Hay Loading Machine Co., H. L. Shields supt., Troy, N. Y.; Douglas' patent American hay loader, width of an ordinary wagon, and attachable thereto, $100 .... Certificate of Merit.

Wheeler, Melick & Co., Albany, N. Y.; for the extent and general excellence of their display of implements and machines.. Silver Medal.

J. C. Osgood, Troy, N. Y.; patent ditching machine, $1,000 .... Certificate of Merit.

Horace L. Emery, Albany, N. Y.; Cotton Gin Condenser and Feeder.................. Certificate of Highest Merit.

No. 18. IMPLEMENTS, SECOND LIST.

HAY OR CATTLE SCALES.

Edward F. Jones, Binghamton, N. Y.; four ton hay scale, $75 .... Bronze Medal.

SEPARATING, CLEANING AND ASSORTING MACHINES.

J. A. Krake, Alden, N. Y.; Krake's Little Giant grain and seed cleaner, chaffs and cleans grain and seed ready for seed at one operation, $30................ Bronze Medal.

FEED CUTTERS, HAND AND POWER.

Younglove, Many & Co., Cleveland, Ohio, by R. H. Allen & Co., agents, N. Y.; Continental Feed Cutter, $25........ Bronze Medal.

PORTABLE SAW MILLS.

Le Roy Mowry, Sandy Hill, N. Y.; circular saw mill, complete, with 24 feet carriage and head blocks, $600............. Bronze Medal.

FARM GRAIN MILLS.

Horace L. Emery, Albany, N. Y.; Parmenter's improved Felton's feed mill..... Bronze Medal.

CIDER MAKING APPARATUS.

J. W. Mount, Medina, N. Y........ Bronze Medal.

Samuel Males, Cincinnati, O.; cider and wine mills..................... Certificate of Merit.

PUMPS FOR FARM USE.

Nicholas Clute, Schenectady, N. Y.; Clute's National pump, $20........... Bronze Medal.

WASHING MACHINES.

Brinkerhoff Manufacturing Co., Auburn, N. Y.; Continental washing machine.... Bronze Medal.

Hallenbeck & Barrett, Chatham Village, N. Y.; Putnam's patent, $15................. Certificate of Highest Merit.

CLOTHES WRINGERS.

Brinkerhoff Manufacturing Co., Auburn, N. Y.; Continental clothes wringer ..... Bronze Medal.

MORTISING MACHINES.

J. H. Burdick, Albany, N. Y. ...... Bronze Medal.

MACHINES FOR SHARPENING KNIVES OF MOWERS AND REAPERS.

William H. Field, Port Chester, N. Y.; Curtis' patent scythe holder, for grinding mower and reaper knives .... Bronze Medal

APPARATUS FOR STEAMING FOOD FOR STOCK.

Harry Sedgwick, Cornwall Hollow, Conn.; Elmwood steamer, for steaming food for stock, running small engines, etc.. Bronze Medal.

E. E. Sill, Rochester, N. Y.; Eagle steamer and cauldron for general cooking purposes and generating steam .... Certificate of Merit.

EXTRA AWARDS.

LAWN MOWERS.

Chadborn & Coldwell Manufacturing Co., Newburgh, N. Y.; No. 4 Excelsior horse lawn mower........... Certificate of Highest Merit.

H. N. Swift, Matteawan, N. Y.; Swift pioneer lawn mower .... Certificate of Merit.

HAY AND OTHER PRESSES.

P. K. Dederick, Albany, N. Y.; for the extent and general merit of his display... Silver Medal.

MACHINERY FOR MANUFACTURING BLINDS.

Davis & Gledhill, Albany, N. Y..... Bronze Medal.

MACHINERY FOR WIRING BLINDS.

B. C. Davis, Binghamton, N. Y.............. Certificate of Highest Merit.

MOULDING MACHINE.

Daniel Doncaster, Albany, N. Y. .... Bronze Medal.

SCROLL SAWING MACHINES, ETC.

Jerome S. Mosely, Syracuse, N. Y.; Eureka scroll sawing machine for all sorts of ornamental scroll work, $175..Certificate of Merit.

Oneonta Head Cutter Co., Oneonta, N. Y.; American heading cutter...Certificate of Merit.

METAL WORKING MACHINERY.

Hyatt Manufacturing Co., Albany, N. Y.; patent spherical turning lathe......Bronze Medal.

STEAM PUMPS.

Robert Hardee, Albany, N. Y.; Hardee's patent pump....................Bronze Medal.

TURBINE WATER WHEELS.

P. H. Wait, Sandy Hill, N. Y.; "Hudson River Champion" turbine water wheel without curb, with register gate......Certificate of Highest Merit.

E. P. H. Capron, Hudson, N. Y.; Capron's turbine water wheel.......Certificate of Merit.

MISCELLANEOUS.

Eugene Campbell, Medusa, N. Y.; Campbell's patent railroad car coupler..Certificate of Merit.

Jacob Messenger, Albany, N Y.; Gantz patent conductor clasp...........Certificate of Merit.

J. W. Osborn & Martin, Albany, N. Y.; galvanized iron building ornaments....Bronze Medal.

Robert N. Short, Mechanicsburgh, Pa.; Fish's patent champion tuyere......Certificate of Highest Merit.

Townsend & Jackson, Albany, N. Y.; Blessing's patent steam piston and valve rod packing.................Certificate of Merit.

Townsend & Jackson, Albany, N. Y.; Crane's patent self-oiling adjustable hangers...... Bronze Medal.

Townsend & Jackson, Albany, N. Y.; Blessing's patent friction coupling....Bronze Medal.

Townsend & Jackson, Albany, N. Y.; Blessing's patent shaft coupling.......Bronze Medal.

Townsend & Jackson, Albany, N. Y.; Blessing's patent steam trap.........Bronze Medal.

Townsend & Jackson, Albany, N. Y.; machinery castings......................Bronze Medal.

J. R. Tunnicliff, Van Hornesville, N. Y.; patent tobacco stripping and booking machine.... Certificate of Merit.

Wm. R. Waterhouse, Liverpool, N. Y.; Waterhouse's improvement in operating barn doors......................Certificate of Merit.

Williams & Co., Fonda, N. Y.; Williams' patent brick machine for making pressed bricks.. Certificate of Merit.

C. C. Bradley & Son, Syracuse, N. Y.; for general excellence of their display of implements.........................Silver Medal.

No. 19.—TOOLS AND HAND IMPLEMENTS FOR THE FARM AND GARDEN.

GRAIN CRADLES.

First Prize, Russell Morgan, Fayetteville, N. Y.; by M. E. Viele, agent, Albany, N. Y...... $5

STEEL GARDEN RAKES.

First prize, Tuttle Manufacturing Co., Naugatuck, Conn.; by M. E. Viele, agent, Albany, N. Y.................................. 5

HAY FORKS.

First prize, Batcheller & Sons, Wallingford, Vt.; by M. E. Viele, agent, Albany, N. Y...... 5

MANURE FORKS.

First prize, Tuttle Manufacturing Co., Naugatuck, Conn.; by M. E. Viele, agent, Albany, N. Y.................................. 5

Second, Batcheller & Sons, Wallingford, Vt.; by M. E. Viele, agent, Albany, N. Y........ 3

SPADING FORKS.

First prize, Tuttle Manufacturing Co., Naugatuck, Conn.; by M. E. Viele, agent, Albany, N. Y.................................. 5

GRASS SCYTHES.

First prize, Eagle Co., Rivertown, Conn.; by M. E. Viele, agent, Albany, N. Y........ 5

HOES.

First prize, Tuttle Manufacturing Co., Naugatuck, Conn.; by M. E. Viele, agent, Albany, N. Y.................................. 5

POTATO HOOKS.

First prize, Tuttle Manufacturing Co., Naugatuck, Conn.; by M. E. Viele, agent, Albany, N. Y.................................. 5

Second, Batcheller & Sons, Wallingford, Vt.; by M. E. Viele, agent, Albany, N. Y........ 3

EXHIBITION OF AUGERS AND BORING IMPLEMENTS.

First prize, Edward Carter, agent, Troy, N. Y., 5

EXHIBITION OF FARM AND GARDEN TOOLS.

First prize, Volckert P. Douw, Albany, N. Y.. 10

EXHIBITION OF SAWS.

First prize, Edward Carter, Troy, N. Y....... 5

EXHIBITION OF DRAINING TILES.

Greenwich Pottery Co., New York; by Branion & Brother, agents, Albany, N. Y......... 5

George Jackson, Albany, N. Y..Certificate of Merit.

Calvin Lockrow, Troy, N. Y.; cement, sewer and drain pipes ....Certificate of Merit.

EXTRA AWARDS.

George W. Brokaw, Lodi, N. Y.; "Climax" patent automatic apple paring and slicing machine.................Certificate of Merit.

George M. Evans, Toronto, Canada; combined wheelbarrow and step-ladder........... Certificate of Merit.

H. H. Ingalsbe, South Hartford, N. Y.; Champion tree pruner ..Certificate of Highest Merit.

Harry Sedgwick, Cornwall Hollow, Conn.; Rose's combined tire shrinker, punch and shears for blacksmiths and wagon makers. Certificate of Merit.

J. P. Sinclair, Mottville, N. Y.; Sinclair's patent mill pick handles .... Certificate of Highest Merit.

J. D. Smith, Greig, N. Y.; machine for grinding edge tools ....Certificate of Merit.

C. T. Bush, Schenevus, N. Y.; samples iron fence ....Certificate of Highest Merit.

No. 20. Wagons, Carriages, Saddlery and Articles of Wheelwright's and Blacksmith's Work.

Double Covered Carriages.

First prize, James Goold & Co., Albany, N. Y.; britzka lined with leather on C springs, with book steps, tires and axles Bessemer steel, $1800 .... $10

Double Pleasure Wagon.

First prize, Shaw & Rose, Albany, N. Y.; two seated wagon, half top, platform springs, $650 10

Second, James Goold & Co., Albany, N. Y.; country gentlemen's carriage, or Elm City Rockaway, lined with brown cloth, three elliptic springs, steel tires and axles, $775. 5

Shaw & Rose, Albany, N. Y.; three spring two seated wagon half top, $550 .... Certificate of Highest Merit.

Top Buggys.

First prize, E. Chamberlin, Son & Co., Troy, N. Y.; square box top buggy with elliptic springs, $350 10

Second, Shaw & Rose, Albany, N. Y.; concave front yacht.......................... 5

Shaw & Rose, Albany, N. Y.; piano box round corners ....Certificate of Highest Merit.

Open Buggy.

First prize, E. Chamberlin, Son & Co., Troy, N. Y.; three-quarter seat road wagon half springs, $250 10

Second, Shaw & Rose, Albany, N. Y.; light single seat yacht, elliptic springs 5

Shaw & Rose, Albany, N. Y.; light single seat yacht, elliptic springs.... .... Certificate of Highest Merit.

Double Sleighs.

First prize, Shaw & Rose, Albany, N. Y.; family barouche, $500.................. 10

Second, James Kingsbury, Albany, N. Y.; extension top, $450....................... 5

James Goold & Co., Albany, N. Y.; pony sleigh lined with crimson plush (4 seats) $450 ....Certificate of Highest Merit.

Single Sleighs.

First prize, Shaw & Rose, Albany, N. Y.; light Portland, $120......................... $10

Second, William T. Johnston, Albany, N. Y.; $225 5

Shaw & Rose, Albany, N. Y.; road Portland, $120............Certificate of Highest Merit.

Double Farm Wagons.

First prize, James W. Jolley, Coeymans, N. Y.; $200 10

Assortments of Wagon Wood Work.

First prize, Lyman D. Cook, Tippecanoe City, Ohio 10

Farm Harnesses.

First prize, David Mackie, Albany, N. Y.; $75 5

Extra Awards.

Woodburn Sarven wheel Company, Indianapolis, Ind., for patent wheels 5

William Angus, Albany, N. Y.; Scotch and American hames ....Certificate of Merit.

C. C. Bradley & Son, Syracuse, N. Y.; bob-sleds with Cady's metallic knees......... Certificate of Highest Merit.

David Mackie, Albany, N. Y.; cart harness, $35 Certificate of Merit.

D. M. Greene, *Troy, N. Y.*
A. A. Sweet, *Albany, N. Y.*
W. Anson Wood, *Hoosick Falls, N. Y.*
J. M. Williams, *Salem, N. Y.*

No. 21. Stoves, etc.

Cooking Stoves for Wood.

First prize, Daniel E. Paris & Co., Troy, N. Y.; "Guard," largest oven cooking stove for burning wood, with galvanized cast iron reservoir and warming closet, $35........ Bronze Medal.

Second, Swett, Quimby & Perry, Troy, N. Y.; "New Empire," $60.....Certificate of Merit.

Cooking Stoves for Coal.

First prize, Swett, Quimby & Perry, Troy, N. Y.; "New Empire," $60..........Bronze Medal.

Second, S. H. Ransom & Co., Albany, N. Y.; "Modern Vulcan," with plain top and with extension top, with copper-lined cast iron reservoir and hot closet....Certificate of Merit.

Cooking Stoves—Coal or Wood.

First prize, S. H. Ransom, Albany, N. Y.; "Modern Vulcan," with plain top and with extension top, with copper-lined cast iron reservoir and hot closet ....Bronze Medal.

Second, Perry & Co., Albany, N. Y.; "New American," cooking stove..Certificate of Merit.

William Doyle, Albany, N. Y.; for general excellence of his display of stoves....... Certificate of Highest Merit.

COOKING RANGES.

First prize, Swett, Quimby & Perry, Troy, N. Y.; "Empire Cooking and Heating Range," $100.................Bronze Medal.

HOT-AIR FURNACES.

First prize, Perry & Co., Albany, N. Y.; Oriental Base-burning Furnace..........Bronze Medal.

Morrison & Colwell, Troy, N. Y.; double dome base-heating furnace.................... Certificate of Highest Merit.

Sheldon, Greene & Co., Troy, N. Y.; Henderson cone furnace, either portable or set in brick, for hard coal.......Certificate of Merit.

PARLOR STOVES FOR WOOD.

First prize, S. H. Ransom & Co., Albany, N. Y.; "Woodland," round top and base castings, with cast iron lining and diving flue on three-flue principle, with new regulator, $18 ....Bronze Medal.

PARLOR STOVES FOR COAL.

First prize, Hicks and Wolfe, Troy, N. Y.; "Superb" base-burning parlor stove..... Bronze Medal.

Treadwell Stove Co., Albany, N. Y.; the "Illuminator," No. 13, $36, with boiling and baking attachment, $42...Certificate of Merit.

HALL STOVES FOR COAL.

S. H. Ransom & Co., Albany, N. Y.; the "Light House" base burner stove, with diving flue, with or without second story heating attachment, and with or without portable oven.....Certificate of Highest Merit.

HOLLOW WARE.

J. McB. Davidson, Albany, N. Y.; enamelled hollow ware...................Bronze Medal.

John A. Goewey, Albany, N. Y.; plain hollow ware.........................Bronze Medal.

CASTINGS.

First prize, James McKinney, Albany, N. Y.; architectural iron work ....Bronze Medal.

EXTRA AWARDS.

Daniel E. Paris & Co., Troy, N. Y.; "Mansard Parlor Cook" for coal or wood, $20...... Certificate of Merit.

Stuart & Peterson, Philadelphia, Pa., by S. & J. A. Baker, agents, Albany, N. Y.; "Sunny Side" fire-place heater, $50 ...Bronze Medal.

Clarke & Utter, Rockford, Ill., by Horace L. Emery, Albany, N. Y.; sectional steam generator, for heating purposes and driving steam engines............Certificate of Merit.

James Easterly, Albany, N. Y.; patent coal reservoir, for converting cooking stoves and ranges into self-feeding base-burners.. Certificate of Merit.

Palmer, Newton & Co., Albany, N. Y.; fire-brick, stove linings, &c....Certificate of Merit.

Perry & Co., Albany, N. Y.; marbleized ventilating platform for stoves......Bronze Medal.

A. A. SWEET, *Syracuse*.
LYMAN BENEDICT, *Hoosick Falls*.

CLASS V. FARM PRODUCE.

No. 22. GRAIN, SEEDS, HOPS, GROWN IN 1871.

WHITE WINTER WHEAT.

First prize, Justus Corbin, Liverpool, N. Y.; Treadwell $10

Second, O. Howland, Auburn, N. Y.; Diehl... 5

RED WINTER WHEAT.

First prize, Justus Corbin, Liverpool, N. Y.... 10

Second, O. Howland, Auburn, N. Y.; Mediterranean 5

RED SPRING WHEAT.

First prize, Ai Pine, Pittstown, N. Y......... 10

RYE.

First prize, H. Schoonmaker, Cedar Hill, N. Y. 10

Second, A. E. Van Allen, Defreestville, N. Y .. 5

WHITE OATS.

First prize, George W. Bender, New Scotland, N. Y.................................. 10

Second, William Newton, Henrietta, N. Y.; Probesteier 5

BLACK OR GRAY OATS.

First prize, John Stryker, Rome, N. Y. 10

Second, H. Schoonmaker, Cedar Hill, N. Y.... 5

TWO-ROWED SPRING BARLEY.

First prize, A. L. Thomas, Cuba, N. Y........ 10

Second, Robert Bell, West Brighton, N. Y..... 5

FOUR-ROWED SPRING BARLEY.

First prize, Robert Bell, West Brighton, N. Y. 10

YELLOW INDIAN CORN, SHELLED.

First prize, Ai Pine, Pittstown, N. Y. 10

Second, Justus Corbin, Liverpool, N. Y....... 5

FIELD BEANS, LARGE.

First prize, Horace Ames, Moscow, N. Y., marrowfat 10

FIELD BEANS, SMALL.

First prize, A. L. Thomas, Cuba, N. Y........ 10

FIELD PEAS, LARGE.

First prize, L. L. French, Richfield Springs, N. Y................................ 10

BUCKWHEAT.

First prize, George W. Bender, New Scotland, N. Y................................ 5

TIMOTHY SEED.

First prize, George W. Bender, New Scotland, N. Y................................ 5

Second, O. Howland, Auburn, N. Y.......... 3

SORGHUM SEED.

Second prize, Mrs. J. T. Van Namee, Pittstown, N. Y. $3

TWENTY-FIVE SEED EARS YELLOW CORN, EIGHT-ROWED.

First prize, Ai Pine, Pittstown, N. Y........ 5
Second, William Newton, Henrietta, N. Y..... 3

TWENTY-FIVE SEED EARS YELLOW CORN, TWELVE-ROWED.

First prize, William Newton, Henrietta, N. Y.. 5
Second, Justus Corbin, Liverpool, N. Y....... 3

EARLY SWEET CORN.

First prize, Ai Pine, Pittstown, N. Y......... 5
Second, Justus Corbin, Liverpool, N. Y....... 3

LATE SWEET CORN.

First prize, C. W. Crosman, Rochester, N. Y.. 5
Second, Justus Corbin, Liverpool, N. Y....... 3

BALES OF HOPS.

First prize, J. L. Fursman, Schodack Centre, N. Y. 10

EXTRA AWARDS.

R. H. Allen & Co., New York; fertilizers made from dried blood, flesh and offal ..Commended.

C. W. Crosman, Rochester, N. Y.; collection of garden seeds........ ....Commended.

Volckert P. Douw, Albany, N. Y.; collection of garden seeds....................Commended.

William Newton, Henrietta, N Y.; hundred day Dent corn, yellow variety........Commended.

John Ralston & ' '. New York; Baugh's raw phosphate, Co..on Bale brand of dissolv d bones and ammonia, Crescent bone dust, Clement Mills ·· ıe, bone filings bone meal, Sea Island soluble phosphate and ground raw bones ....Commended.

Reed & Powell, Coxsackie, N. Y.; concentrated ammoniated phosphate of lime....Commended.

NO. 23. VEGETABLES.

CABBAGES.

First prize, C. W. Crosman, Rochester, N. Y.. $3

LETTUCE.

First prize, C. W. Crosman, Rochester, N. Y.. 3
Second, Mrs. J. T. Van Namee, Pittstown, N.Y. 2

MANGOLDS AND BEETS.

First prize, C. W. Crosman, Rochester, N. Y.. 3
Second, M. E. Myers, Charlton, N. Y 2

ORANGE CARROTS.

First prize, C. W. Crosman, Rochester, N. Y.. 3

WHITE CARROTS.

First prize, C. W. Crosman, Rochester, N. Y.. 3

PARSNIPS.

First prize, C. W. Crosman, Rochester, N. Y.. 3

SALSIFY.

Second prize, C. W. Crosman, Rochester, N. Y. $2

KOHL-RABI.

First prize, C. W. Crosman, Rochester, N. Y.. 3
Second, Mrs. J. T. Van Namee, Pittstown, N. Y. 2

ONIONS.

First prize, C. W. Crosman, Rochester, N. Y.. 3
Second, Justus Corbin, Liverpool, N. Y....... 2

TOMATOES.

First prize, C. W. Crosman, Rochester, N. Y.. 3
Second, Thomas J. Hand, Sing Sing, N. Y.... 2

EGG PLANTS.

First prize, C. W. Crosman, Rochester, N. Y.. 3

GARDEN BEANS.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y.................................. 3
Second, C. W. Crosman, Rochester, N. Y. 2

PEPPERS.

First prize, C. W. Crosman, Rochester, N. Y.. 3
Second, Mrs. W. H. Graves, Blossvale, N. Y.. 2
Mrs. J. T. Van Namee, Pittstown, N. Y..... Commended.

SQUASHES.

First prize, C. W. Crosman, Rochester, N. Y.. 3

FIELD PUMPKINS.

First prize, Ai Pine, Pittstown N. Y.......... 3
Second, C. W. Crosman, Rochester, N. Y. 2

POTATOES.

First prize, Reisig & Hexamer, New Castle, N. Y.................................. 3
Second, C. W. Crosman, Rochester, N. Y 2

COLLECTIONS OF VEGETABLES.

First prize, C. W. Crosman, Rochester, N. Y.. 10

EXTRA AWARDS.

Reisig & Hexamer, New Castle, N. Y., for their exhibition of 318 varieties of potatoes; Special Award by the Executive Committee .. Large Silver Medal.

C. W. Crosman, Rochester, N. Y.; Egyptian beet........................Commended.

C. W. Crosman, Rochester, N. Y.; Trophy tomato..... ....Commended.

H. Schoonmaker, Cedar Hill, N. Y.; white and black winter radishes ....Commended.

NO. 24. FLOUR, ETC.

WHITE WHEAT FLOUR, WITH SAMPLE OF THE WHEAT AND STATEMENT OF THE QUANTITY USED TO MAKE THE BARREL OF FLOUR.

First prize, Justus Corbin, Liverpool, N. Y. .. 10

STARCH FROM CORN.

First prize, Mrs. Abram Stone, Stanwix, N. Y. 5

STARCH FROM WHEAT.

First prize, Mrs. Charity Hakes, Stanwix, N. Y. $5

HOMINY.

First prize, Mrs. Abram Stone, Stanwix, N. Y. 5

Your committee would call attention to some specimens of wheat exhibited by J. J. Henderson, of Portland, Oregon. Among them we find Oregon white fall, said to yield 70 bushels per acre; Oregon mixed fall, 50 bushels; Oregon red spring, 75 bushels; Canada club, 70 bushels, and White Australian, 80 bushels. Also specimens of little white club and little club wheat, and a bunch of thirty-one heads of Australian wheat grown from one seed.

The exhibition of Watson & Clark, of Philadelphia, Pa., of a super-phosphate composed of bone, sulphuric acid and guano, we consider worthy of special mention. Also the Twin Brother's yeast, exhibited by E. V. Burton, is a very fine exhibition and worthy of notice.

All of which is respectfully submitted.

C. B. WAY, *Camillus, N. Y.*
R. W. PRATT, *Fort Edward, N. Y.*

No. 25. BUTTER.

FIFTY POUNDS OF JUNE BUTTER.

First prize, John Stryker, Rome, N. Y. $20
Second, Mrs. Abram Stone, Stanwix, N. Y. 15
Third, L. L. French, Richfield Springs, N. Y .. 10

FIFTY POUNDS OF BUTTER MADE AT ANY TIME.

First prize, J. W. & H. Vandresser, Cobleskill, N. Y. 20
Second, Mrs. George F. Hull, New Lebanon, N. Y. 15
Third, John Stryker, Rome, N. Y. 10

FIVE POUNDS OF BUTTER IN ONE POUND ROLLS.

First prize, Mrs. Thomas J. Hand, Sing Sing, N. Y. 10
Second, Miss Minerva Pine, Pittstown, N. Y... 5
M. E. Myers, Charlton, N. Y. ....Commended.

No. 26. CHEESE.

AMERICAN CHEESE—FACTORY OR OTHER, OVER ONE YEAR OLD, NOT LESS THAN FORTY POUNDS WEIGHT.

First prize, L. L. Wight, Whitesboro, N. Y.; made at Whitesboro factory, Whitesboro, N. Y. $20
Second, Jacob Ellison, Newport, N. Y.; cheese colored with annattoine 15
Third, P. Miller, Fredonia, N. Y.; factory..... 10

AMERICAN CHEESE—FACTORY OR OTHER, LESS THAN ONE YEAR OLD.

First prize, P. Miller, Fredonia, N. Y.; factory, 20
Second, L. L. Wight, Whitesboro, N. Y.; made at Whitesboro factory, Whitesboro, N. Y. 15

FIVE CHEESES.

First prize, L. L. Wight, Whitesboro, N. Y.; made at Whitesboro factory, Whitesboro, N. Y. $20
Second, Old Salisbury factory, by Whitman & Burrell, agents, Little Falls, N. Y. 15
Third, P. Miller, Fredonia, N. Y.; factory..... 10

THREE FACTORY MADE CHEESES.

First prize, P. Miller, Fredonia, N. Y. 15
Second, L. L. Wight, Whitesboro, N. Y. 10

THREE CHEESES MADE IN A PRIVATE DAIRY.

First prize, M. E. Myers, Charlton, N. Y. 15

THREE PREPARED RENNETS.

First prize, Mrs. Abram Stone, Stanwix, N. Y. 10
Second, William Ralph, Utica, N. Y. 5

No. 27.—BREAD, SUGAR, ETC.

WHEATEN BREAD.

First prize, Mrs. Abram Stone, Stanwix, N. Y. 5
Second, Mrs. Charity Hakes, Stanwix, N. Y... 3

RYE BREAD.

First prize, M. E. Myers, Charlton, N. Y. 5
Second, Miss Minerva Pine, Pittstown, N. Y.. 3

RYE AND INDIAN BREAD.

First prize, M. E. Myers, Charlton, N. Y. 5
Second, Mrs. Abram Stone, Stanwix, N. Y.... 3

MAPLE SYRUP.

First prize, Mrs. W. H. Graves, Blossvale, N. Y. 5
Second, Mrs. Abram Stone, Stanwix, N. Y.... 3

PRESERVED FRESH FRUITS.

First prize, Mrs. S. M. Birch, Albany, N. Y .. 5
Second, Jennie Schoonmaker, Cedar Hill, N. Y. 3

PICKLES IN VINEGAR.

First prize, Jennie Schoonmaker, Cedar Hill, N. Y. 5
Second, Mrs. W. H. Graves, Blossvale, N. Y... 3

DRIED APPLES.

First prize, Miss Minerva Pine, Pittstown, N. Y. 5
Second, P. Miller, Fredonia, N. Y. 3

DRIED WHORTLEBERRIES.

First prize, Mrs. W. H. Graves, Blossvale, N. Y. 5

DRIED RASPBERRIES.

First prize, Mrs. W. H. Graves, Blossvale, N. Y. 5
Second, P. Miller, Fredonia, N. Y. 3

PRODUCT OF BOX HONEY BY ONE COLONY THIS SEASON.

First prize, Quinby & Root, St. Johnsville, N. Y. 20
Second, Jasper Hazen, Albany, N. Y. 10

PRODUCT OF EXTRACTED HONEY BY ONE COLONY THIS SEASON.

First prize, Quinby & Root, St. Johnsville, N. Y. $20

TEN POUNDS BOX HONEY.

First prize, Quinby & Root, St. Johnsville, N. Y. 5

Second, C. C. Van Deusen, Sprout Brook, N. Y. 3

FIVE POUNDS OF EXTRACTED OR STRAINED HONEY.

First prize, C. C. Van Deusen, Sprout Brook, N. Y. 5

Second, Quinby & Root, St. Johnsville, N. Y. .. 3

EXTRA AWARDS.

E. J. Larrabee & Co., Albany, N. Y.; Albany biscuit and crackers.... Certificate of Highest Merit.

National Yeast Co., Seneca Falls, N. Y.; National yeast cake .... Certificate of Merit.

Quinby & Root, St. Johnsville, N. Y.; honey extractor.... Certificate of Merit.

Quinby & Root, St. Johnsville, N. Y.; bee-hive .... Certificate of Merit.

C. C. Van Deusen, Sprout Brook, N. Y.; bee-feeder.. .... Certificate of Merit.

COMMENDED.

Mrs. Augusta Hertz; loaf of fancy cake.

H. O. Peabody, Boston, Mass.; honey extractor.

DAIRY APPARATUS.

CHURNS FOR LARGE AND SMALL DAIRIES.

First prize, P. Blanchard's Sons, Concord, N. H., by R. H. Allen & Co., agents, N. Y.; the Blanchard churn.... Bronze Medal.

Karns, Douthett & Co., Springdale, Pa.; Tornado churn with power attachment...... Certificate of Merit.

OTHER DAIRY APPARATUS.

N. C. Burnap, Argusville, N. Y., by D. W. Seeley, agent, Cedar Hill, N. Y.; Burnap's patent milk pans.... Certificate of Highest Merit.

A. P. Bussey, Westernville, N. Y.; milk deodorizer and cooler.... Certificate of Merit.

H. C. & D. C. Markham, Collinsville, N. Y.; improved curd sink for cheese factories and smaller dairies. Certificate of Highest Merit.

L. R. Townsend, Malone, N. Y.; Jewett's patent milk pans for cooling milk and raising cream .... Certificate of Merit.

J. H. Smiley, Slaterville, N. Y.; churn thermometer.... Certificate of Highest Merit.

William Ralph, Utica, N. Y.; Oneida cheese vat.... Certificate of Highest Merit.

COMMENDED.

L. R. Townsend, Malone, N. Y.; fine tub of butter; made at Lytte's Cold Spring factory, using Jewett's patent milk pans.

L. L. Wight, Whitestown, N. Y.; patent cheese vat fastener.

Pope & Tuttle, Randolph, N. Y.; milk cooler and cream raiser.

Holden & Brothers, Woburn, Mass.; patent lightning churn.

J. P. Corbin, Whitney's Point, N. Y.; Eureka butter worker.

N. C. Burnap, Argusville, N. Y.; dinner kettle.

Arnold ventilator for milk cans.

L. L. Wight, Whitesboro, N. Y.; milk airing apparatus.

T. D. CURTIS, *Utica, N. Y.*
J. H. IVES, *Salisbury, N. Y.*

No. 28. DOMESTIC WINES, ETC.

There were only two exhibitors, legitimate wine manufacturers, sending wines for examination, viz.: the Pleasant Valley and the Urbana Wine Companies, both located at Hammondsport, Steuben county, N.Y. In relation to their wines, in general, decided improvement has marked their productions for many years past, and the *newer* ones, now for the first time exhibited at the State Society, we think superior in flavor, and completeness in body and taste to any previously offered, proving a steady and most gratifying progress in wine manufacture, and determining, *for the future*, the permanent success of wine culture in certain localities of our State, under an intelligent management of the business. The samples exhibited were as follows:

Dry Catawba, still wine, Pleasant Valley Co., 8°.

Dry Catawba, still wine, Urbana Co., 10°, fixing the highest standard of excellence at 10°.

Dry Delaware, still, Urbana Co., of rather unusual flavor, which cannot well be accounted for, yet a good wine, 8°.

Dry Iona, of 1870, Urbana Co., fine, 10°.

Urbana Co., Isabella claret, 5°.

Urbana Co., still Catawba, sweet, first quality *ladies'* wine, 10°.

Urbana Co., still Isabella, sweet, medium ladies' wines, 7°.

Pleasant Valley Co., sparkling, "Great Western" brand, fine, more nearly approaching the best foreign champagnes than any heretofore offered, 10°.

Urbana Co., sparkling, "Gold Seal," rich, rather sweet, an excellent wine, well adapted to American tastes, 10°. Both these brands we consider among the first class champagnes, being made of several varieties of grapes mixed in the *must*.

Pleasant Valley Co., "Paris Exposition" brand, of the usual quality, heretofore highly commended by the wine committees of the Society, 8°.

Urbana Co., "Delaware Sparkling," an excellent light champagne, 8°.

Urbana Co., "Imperial," a standard wine, of old brand, retaining its former good character, 10°.

Urbana Co., "Diana Sparkling," of high flavor, characteristic of the grape, a choice article to those who prefer delicate *fruity* flavor, 10°.

Urbana Co., "Catawba Brandy," an article of the highest quality, needing only greater age to make it perfect.

All the above articles appear on the catalogue as "entered for exhibition only;" therefore the Committee do not consider themselves authorized to award premiums for them; yet they give them the highest commendation for their fine qualities, and premiums would not be withheld by the Committee did they consider it within their discretion to award them.

Christian Hauser, of Rochester, N. Y., exhibited samples of wine as follows: Still wines, Diana, Isabella, Concord, Catawba, and of mixed varieties of grape. All the samples of the German character, light, and of good quality. Silver medal awarded.

Mr. Hauser also exhibited samples of Sparkling, Diana, Concord and Catawba champagnes. These, although of fine character, were not up to the high standard of excellence of the champagnes of the Pleasant Valley and Urbana Companies, yet show a gratifying progress in wine-making art, and worthy of a second prize. Both of Mr. Hauser's wines were entered for competition, but as no wines were in competition against them, the awards are upon their *merits* only.

Cordials.

H. D. Monk, Greenbush, N. Y., exhibited some samples of still "wines," so called, made from various grapes. They do not come up to the standard of wines proper, but as cordials for family use they are entitled to commendation.

Cider.

Of this so-called article there were several samples, *all corked*. We award no premiums on them.

Cider Vinegar.

Miss Minerva Pine, Pittstown, N. Y.; extra fine in quality; first prize.

John Stryker, Rome, N. Y.; first quality; second prize.

Mrs. W. H. Graves, Blossvale, N. Y.; not of passable quality.

Awards.

Wines from Native Grapes.

First prize, Christian Hauser, Rochester, N. Y., Large Silver Medal.

Cider Vinegar.

First prize, Miss Minerva Pine, Pittstown, N. Y. $5
Second, John Stryker, Rome, N. Y. 3

L. F. Allen, *Buffalo, N. Y.*
M. P. Wilder, *Boston, Mass.*
F. R. Elliott, *Cleveland, O.*

No. 29. Domestic Manufactures.

Pairs of Woolen Blankets.

First prize, Miss Minerva Pine, Pittstown, N. Y. $5
Second, Harriet Brownell, Berne, N. Y. 3

All Wool Horse Blankets.

First prize, John Stryker, Rome, N. Y. 5
Second, Mrs. W. H. Graves, Blossvale, N. Y. .. 3

Ten Yards of Woolen Cloth.

First prize, Mrs. Charity Hakes, Stanwix, N. Y. 5
Second, Mrs. Abram Stone, Stanwix, N. Y. 3

Ten Yards of Woolen Flannel.

First prize, Mrs. W. H. Graves, Blossvale, N. Y. 5

Ten Yards Flannel, Cotton Warp.

First prize, Mrs. Charity Hakes, Stanwix, N. Y. 5
Second, Mrs. W. H. Graves, Blossvale, N. Y. .. 3

Ten Yards of Linsey Woolsey.

First prize, Mrs. W. H. Graves, Blossvale, N. Y. 5

Ten Yards Cotton and Wool Kersey.

First prize, Harriet Brownell, Berne, N. Y. 5
Second, Mrs. Abram Stone, Stanwix, N. Y. 3

Knit Bed Spreads.

First prize, Mrs. A. A. Peck, Albany, N. Y. 3
Second, Mrs. G. Doelker, Albany, N. Y. 2

Patch Work Bed Quilts.

First prize, Miss Rhoda Ransom, Durham, N. Y. 3
Second, Mrs. Justin Moulton, West Troy, N. Y. 2

Silk Quilts.

First prize, Mrs. Mary Spawn, Albany, N. Y. 3
Second, Mrs. Theodore Edwards, Albany, N. Y. 2

Balmoral Petticoats.

First prize, Mrs. C. M. Stone, Blossvale, N. Y. 3

Woolen Knit Stockings.

First prize, Mrs. W. H. Graves, Blossvale, N. Y. 3
Second, Miss Caroline Brownell, Berne, N. Y. .. 2

Woolen Knit Mittens.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y. 3
Second, Mrs. Abram Stone, Stanwix. N. Y. 2

Fringe Mittens.

First prize, Miss Caroline Brownell, Berne, N. Y. 3
Second, Mrs. W. H. Graves, Blossvale, N. Y. ... 2

Ten Yards of Linen Cloth.

First prize, Mrs. C. M. Stone, Blossvale, N. Y., 5
Second, Mrs. M. E. Piser, Tomhannock, N. Y. 3

TEN YARDS OF LINEN D'APER.

First prize, Miss Caroline Brownell, Berne, N. Y. $5

Second, Harriet Brownell, Berne, N. Y. 3

TEN YARDS OF LINEN KERSEY.

First prize, Mrs. M. E. Piser, Tomhannock, N. Y. 5

TEN YARDS OF TOW CLOTH.

First prize, Mrs. W. H. Graves, Blossvale, N. Y. 5

Second, Harriet Brownell, Berne, N. Y. 3

TEN YARDS OF LINEN BAGGING.

First prize, Mrs. W. H. Graves, Blossvale, N. Y. 5

Second, Mrs. M. E. Piser, Tomhannock, N. Y. 3

LINEN OR COTTON KNIT STOCKINGS.

First prize, Miss E. E. Peck, Albany, N. Y. 3

Second, Mrs. C. M. Stone, Blossvale, N. Y. 2

ONE POUND OF LINEN THREAD.

First prize, Miss Caroline Brownell, Berne, N. Y. 3

Second, Mrs. C. M. Stone, Blossvale, N. Y. 2

ARTICLES IN NO. 29.—EXTRA ENTRIES, AND IN CLASS VII, DEEMED WORTHY OF SPECIAL MENTION.

Miss Lydia Hulsapple, West Troy, N. Y.; wax work (autumn leaves).

Miss Rhoda Ransom, Durham, N. Y.; ladies' embroidered under garments.

Mrs. George Rork, Albany, N. Y.; worsted picture "St. Paul preaching in Athens."

Mrs. Abel Sternberg, Knox, N. Y.; wreath of cut feather flowers.

M. E. Tolles, Quaker Street, New York; specimens of feather wreaths.

Isaac Bulger, agent, Albany, N. Y.; California blankets made from South Down wool.

Charles H. Gardner, Troy, N. Y.; shirts and collars.

H. Bussing, Albany, N. Y.; embroidery, stamping and braiding.

Mrs. W. H. Graves, Blossvale, N. Y.; stocking yarn.

Franc Loomis, Solsville, N. Y.; thread tidy.

M. R. Beaumes, Albany, N. Y.; preserved natural flowers.

Miss C. M. Hewitt, Albany, N. Y.; embroidery.

Charles Fasoldt, Albany, N. Y.; astronomical clock and patent chronometers.

J. Nelegar & Co., Albany, N. Y.; philosophical apparatus.

J. McB. Davidson & Co., Albany, N. Y.; No. 12 triple flange, fire and burglar-proof safe, 10,500 pounds.

Terwilliger & Co., New York, by G. A. Vinton, agent, Albany, N. Y.; welded steel and wrought iron burglar-proof safe, with Williams' wedge and powder-proof door and Yale lock.

G. D. Gillett, Newark, N. J.; Gillett's gig tree.

Albany Frear Stone Co., Albany, N. Y.; artificial stone made from Portland cement and common sharp sand.

John B. Armour, Albany, N. Y.; great variety of brushes.

E. H. Bender, Albany, N. Y.; blank and other books and samples of binding.

Ira Porter, Albany, N. Y.; doors and casings grained to imitate various woods and pedestals painted to imitate marbles.

Wands & Purdy, Albany, N. Y.; wire goods.

Strickland & Co., Albany, N. Y.; plated ware.

William Currier, Crown Point, N. Y.; case of shell work, very fine.

Lina Van Rensselaer (twelve years old), wax cross, very fine.

Killip Brothers, Albany, N. Y.; gentlemens' furnishing goods.

Lansingh & Co., Albany, N. Y.; gentlemens' furnishing goods.

O'Brien & Maher, Albany, N. Y.; china, glassware, etc.

A. & E. C. Koonz, Albany, N. Y.; carpets, rugs, etc.

Taylor & Waterman, Albany, N. Y.; carpets, rugs, etc.

Vroman & Bowers, Syracuse, N. Y.; ladies' fine shoes.

Tilden & Co., New Lebanon, N. Y.; non-poisonous disinfectant.

Craft, Wilson & Co., Albany, N. Y.; mens' and boys' clothing.

R. C. Davis & Co., Albany, N. Y.; mens' and boys' clothing.

C. H. Dunks, Albany, N. Y.; patent noiseless spring bed bottom.

E. C. Hartpence, Albany, N. Y.; cheese safe and cutter combined.

Mrs. Temperance Whipple, Albany, N. Y.; improved process for renovating crape.

Benjamin Burling, Albany, N. Y.; Hercules clothes pin.

H. G. DICKERSON, *Lyons, N. Y.*
JAMES W. MAIRS, *Schenectady, N. Y.*

CLASS VI.—FLOWERS, PLANTS, DESIGNS AND FRUITS.

NO. 30. FLOWERS—PROFESSIONAL LIST.

CUT FLOWERS.

Best display, James Vick, Rochester, N. Y. $10

Second, Briggs & Brother, Rochester, N. Y. 5

DAHLIAS.

Best collection, James Vick, Rochester, N. Y. .. 6

Second, C. W. Crosman, Rochester, N. Y..... $3
Best 24 dissimilar blooms (with names), James Vick, Rochester, N. Y.................. 5
Second, C. W. Crosman, Rochester, N. Y..... 3
Best 12 dissimilar blooms (with names), C. W. Crosman, Rochester, N. Y.............. 3
Second, James Vick, Rochester, N. Y......... 1

ROSES.

Gratest number of the newest and best varieties, Ellwanger & Barry, Rochester, N. Y. 6
Newest and best 24 distinct varieties (with names), Ellwanger & Barry, Rochester, N. Y. 5
Newest and best 12 varieties (with names), Ellwanger & Barry, Rochester, N. Y........ 3

CARNATIONS.

Best display of monthly carnations, James Vick, Rochester, N. Y. 3

PHLOXES.

Greatest number of newest and best varieties, James Vick, Rochester, N. Y............ 5
Second, Briggs & Brother, Rochester, N. Y. .. 3
Best 12 varieties (with names), Ellwanger & Barry, Rochester, N. Y................. 3
Best new seedling, not before exhibited, James Vick, Rochester, N. Y.................. 1

VERBENAS.

Greatest number of newest and best varieties, James Vick, Rochester, N. Y. 5
Newest and best 12 varieties (with names), Briggs & Brother, Rochester, N. Y. 3
Second, James Vick, Rochester, N. Y........ 1
Newest and best 6 varieties (with names), Briggs & Brother, Rochester, N. Y....... 3

GERMAN ASTERS.

Best collection, James Vick, Rochester, N. Y.. 3
Second, Briggs & Brother, Rochester, N. Y ... 1

PANSIES.

Best collection, Briggs & Brother, Rochester, N. Y..................................... 3
Second, James Vick, Rochester, N. Y......... 1

TEN WEEK STOCKS.

Best collection, Briggs & Brother, Rochester, N. Y..................................... 3

GLADIOLUS.

Best collection, James Vick, Rochester, N. Y.. 3
Second, John Dingwall, Albany, N. Y........ 1

No. 31. FLOWERS—AMATEUR LIST.

CUT FLOWERS.

Best display, Mrs. J. T. Van Namee, Pittstown, N. Y................................ 10

DAHLIAS.

Second prize, 12 dissimilar blooms (with names), Mrs. A. Clement, Mechanicville, N. Y.... 1
Best 6 dissimilar blooms (with names), Mrs. A. Clement, Mechanicville, N. Y............ $2

ROSES.

Best 12 varieties (with names), Mrs. J. T. Van Namee, Pittstown, N. Y................ 3

VERBENAS.

Greatest number of newest and best varieties, Mrs. J. T. Van Namee, Pittstown, N. Y.. 5
Best 12 varieties, Mrs. J. T. Van Namee, Pittstown, N. Y............................ 3
Best 6 varieties, Mrs. J. T. Van Namee, Pittstown, N. Y............................ 2

PHLOXES.

Greatest number of newest and best varieties, annual, Mrs. J. T. Van Namee, Pittstown, N. Y. 5
Second prize, 6 varieties (with names), perennial, Mrs. J. T. Van Namee, Pittstown, N. Y. 1

GERMAN ASTERS.

Best collection, Mrs. J. T. Van Namee, Pittstown, N. Y............................ 3

PANSIES.

Best collection, Mrs. J. T. Van Namee, Pittstown, N. Y............................ 3

TEN WEEK STOCKS.

Best display, Mrs. J. T. Van Namee, Pittstown, N. Y................................ 3

EVERLASTING FLOWERS.

Best display, Mrs. S. Clement, Mechanicville, N. Y 3
Second, Mrs. J. T. Van Namee, Pittstown, N. Y................................ 1

No. 32. PLANTS, BOUQUETS, &c.—GENERAL LIST. OPEN TO ALL COMPETITORS.

POT PLANTS.

Best collection of house plants in pots, consisting of 20 different specimens; the variety of the plants, and the manner in which they are grown taken into account, L. Menand, Albany, N. Y.................. $10
Best 10 plants in pots, different species or varieties, L. Menand, Albany, N. Y....... 5

FLORAL DESIGN OR ORNAMENT.

Best, John Dingwall, Albany, N. Y.......... 5
Second, Mrs. J. T. Van Namee, Pittstown, N. Y.................................... 3

BOUQUETS.

Best pair, hand, John Dingwall, Albany, N. Y. 5
Best pair, parlor, John Dingwall, Albany, N. Y. 5
Best basket bouquet, John Dingwall, Albany, N. Y.................................... 5
Best display of newly introduced flowers, not contained in the foregoing list, either cut flowers or in pots, James Vick, Rochester, N. Y. 5

No. 33. Fruits—Professional List.

Apples.

Best 40 varieties and best specimens, correctly named, at least 3 specimens of each, Ellwanger & Barry, Rochester, N. Y........ $15

Pears.

Best 20 varieties and best specimens, correctly named, 3 specimens of each variety, Ellwanger & Barry, Rochester, N. Y........ 15

Best 15 varieties, best specimens of each, Ellwanger & Barry, Rochester, N. Y........ 10

Best six varieties and best specimens, correctly named, six specimens of each, John Dingwall, Albany, N. Y.................... 5

Quinces.

Best dozen apple or orange, Ellwanger & Barry, Rochester, N. Y........................ 3

Second, C. W. Crosman, Rochester, N. Y..... 2

Grapes.

Greatest number of good native varieties and best grown specimens, 3 bunches each, Ellwanger & Barry, Rochester, N. Y..... 6

Second, John Dingwall, Albany, N. Y........ 3

Best 1 variety, 6 bunches, S. W. Underhill, Croton Point, N. Y 2

Second, L. M. Ferris, Poughkeepsie, N. Y..... 1

Watermelons.

Best specimen of any variety, T. M. Benham, Vineland, N. J 1

Muskmelons.

Greatest number of varieties and best specimens, M. G. Reynolds, Rochester, N. Y........ 3

No. 34. Fruits—Amateur List.

Apples.

Best 20 varieties and best specimens, correctly named, at least 3 specimens of each, H. G. Dickinson, Lyons, N. Y................ $12

Second, Robert Bell, West Brighton, N. Y.... 8

Best 15 varieties, and best grown and correctly named, 3 specimens of each, Robert Bell, West Brighton, N. Y.................... 10

Second, H. G. Dickinson, Lyons, N. Y....... 5

Best 10 varieties, correctly named, 6 specimens of each, Robert Bell, West Brighton, N. Y. 5

Pears.

Best 15 varieties and best specimens, correctly named, 3 specimens of each variety, H. G. Dickinson, Lyons, N. Y................ 12

Second, Robert Bell, West Brighton, N. Y.... 8

Best 10 varieties, best specimens and correctly named, 3 specimens of each. Robert Bell, West Brighton, N. Y.................... 10

Second, H. G. Dickinson, Lyons, N. Y....... 5

Best 6 varieties and best specimens, 6 of each, correctly named, Robert Bell, West Brighton, N. Y......................... $8

Second, Jurian Winne, Bethlehem, N. Y...... 4

Plums.

Best 1 variety, 12 specimens, Liberty Gilbert, Troy, N. Y.......................... 2

Quinces.

Best dozen apple or orange, Robert Bell, West Brighton, N. Y......................... 3

Second, Joel Mallary, Sunny Side, N. Y...... 2

Grapes.

Best 1 variety, 6 bunches, Orville Jolley, Coeymans, N. Y..................... 2

Greatest number of varieties and best specimens of foreign grapes, grown under glass, 2 bunches each, Weare C. Little, Albany, N. Y.................................. 6

Second, Casper Ernst, Watervliet, N. Y....... 3

Best 1 variety, 3 bunches, Casper Ernst, Watervliet, N. Y........................... 2

Second, Weare C. Little, Albany, N. Y....... 1

Watermelons.

Best specimen of any variety, C. Burbank, Loudonville, N. Y...................... 1

Special Awards.

Four varieties of pears, F. M. Benham, Vineland, N. J........................... 2

Almonds, F. M. Benham, Vineland, N. J...... 1

Castor bean plant, John Dingwall, Albany, N. Y................................ 1

Opuntia Leucotrichia, Mrs. Morris, Albany, N. Y................................ 1

Lemon tree, E. Stall, North Greenbush, N. Y.. 2

Display of apples, contributed by the farmers of the State of Kansas, and a collection of cereals, exhibited by the Kansas Emigration Society........................ 25

Large Wardian case, stocked with choice plants, Louis Menand, Albany, N. Y............ 10

Collection of cacti, Louis Menand, Albany, N. Y................................ 5

Collection of cycads and tree ferns, Louis Menand, Albany, N. Y................. 5

Parlor fountain, with flowers, C. A. Munger, Syracuse, N. Y........................ 5

Basket, parlor and hand boquets received too late for competition, Ellwanger & Barry, Rochester, N. Y...................... 5

Chas. Downing, *Newburgh, N. Y.*
F. R. Elliott, *Cleveland, O.*
Edward S. Rand, Jr., *Boston, Mass.*

CLASS VII.—MISCELLANEOUS.

AWARDS BY THE JUDGES IN THE MECHANICAL DEPARTMENT.

American Oil Cabinet Company, Boston, Mass.; Wiley patent safety oil cabinets.......... Certificate of Highest Merit.

Embossing Company, Albany, N. Y.; checkers, dominos, etc.................. Bronze Medal.

Celluloid Manufacturing Co., Albany, N. Y.; celluloid goods................ Bronze Medal.

REPORTS OF EXECUTIVE OFFICERS.

CATTLE.

ALBANY, *October* 6, 1871.

I would respectfully report that the cattle department was fully represented in all the different classes, and that a marked improvement was made in the accommodation of stock on the ground over former years. As the judges of the different classes have handed in their reports, it seems superfluous for me to go over them. All the judges deserve the thanks of the Society for their thorough and untiring in dustry in making their awards. And I would here especially bring to notice, Messrs. Haven and Hayes, judges in Jersey stock, for their great faithfulness and anxiety to do justice in this large and well represented class of animals.

ROBERT J. SWAN,
Executive Officer in charge.

SHEEP AND SWINE.

Your Executive officer, in charge of sheep and swine, would respectfully report, that the exhibition in this department was all that any one could reasonably ask in numbers and quality.

Well do I remember the first New York State Fair I ever attended (Utica, in 1845), and looking over the (so-called) very creditable show of sheep and swine, numbering all told not to exceed 90 sheep and 25 hogs. This year, 1871, the number of sheep entered was about 250, swine 200, and most of them were on the ground.

The great advance in the price of wool has given new life to the sheep interest, and breeders report it difficult to supply all orders. The decrease in the number of sheep and the increase of the dairy interest in this State, has been very marked in the past few years.

The low price of pork at present has affected breeders but little. The *pig*, generally called the foulest and most uninviting of animals, is always in high esteem, from the palace where he graces the head of the table, to the lowest cabin, where the "*childers*" give way to the "gintleman that pays the rint;" and notwithstanding all that has been said against his swineship from the time the devils by Divine command, were sent into the herd that went rushing into the sea, to the later lectures of Dr. Gleason and others, few hungry people will turn away from a nice tenderloin or a delicate spare-rib. No farm stock affords a quicker return for the money invested than hogs.

A debateable point is, whether the *large hogs* for which Jefferson and counties in the western part of the State are so famous, are the more desirable, or the finer Essex and Berkshire; whether one thousand pounds of pork can be made more cheaply and of better quality from two pigs, or one thousand pounds from three of the same age. With us in the dairy districts of Chenango, Otsego and Delaware, away from large centres of business, the demand being the home market only, nicely cured hams and shoulders meet a ready sale. These, the smaller Berkshires and Essex and their grades supply in perfection. In this class the late importations of Messrs. Samuel H. Brown and D. B. Haight, of Dutchess Co., show the perfection to which an animal can be brought by careful and judicious breeding.

Not behind them in quality and beauty of specimens on exhibition was, "*Harris, on the pig,*" who unlike many doctors I wot of, practices what he preaches. His pigs were models of cleanliness and docility, as exhibited by the little English boy in charge, who handled each "wee thing" as though "*no mother's near to care.*"

The later importations of Berkshires show the same fine markings, depth of carcase, thick hams and shoulders, but have shorter faces, and more dished. No grades were shown, the product of pure boars of this class upon the common sow of the country. The really fine animals often seen as the result of this cross, would have added much to the interest of the department. I would recommend a special prize for the best pen of pigs, grades (the cross of such a pure boar) bred, not for breeding purposes, but for the butcher only.

The "Poland China," or "Magee" hogs exhibited by Messrs. McLean & Collins, of Henderson, New York, were specimens of a *new breed*, which it is said was produced about 35 years since by a cross of Poland, Byfield, large spotted China, Irish Grazier, and Berkshire, and are claimed to produce more pork for the same amount of corn consumed than any other breed. They are said to be extensively bred in the Western States. Some of those on exhibition were claimed to weigh not less than 1000 pounds each.

There being no class for *large* black or spotted hogs, with the consent of the Executive committee I directed a special premium to be awarded them.

I would notice a very pleasing incident of the Fair, in the presentation of a silver pitcher and goblets, to T. V. Maxon, Superintendent of cattle, sheep and swine, by the exhibitors in those classes, as a mark of esteem for his uniform kindness and cordial assistance to all.

Mr. Maxon and his faithful assistant, Mr. Kellog, did everything to lighten my labors and promote the interest of this department.

JOSEPH JULIAND,
Executive Officer in charge.

POULTRY.

The undersigned executive officer in charge of the Poultry Department, would respectfully report that there was an extensive show of poultry by breeders and fanciers; very few, if any, farmers exhibiting. The want of interest among the latter in this important auxiliary to the farm, arises from the general practice of farmers allowing poultry to take care of themselves; whatever eggs and chance chickens may be obtained, being considered clear gain, thereby not apprehending their full value.

We would urge the importance of more care in the selection and management of fowls for the farm, and we would most emphatically insist that poultry is healthier and better food than pork, and that it can be produced cheaper than this staple diet of the farmers' table. The droppings of the hen, if carefully preserved and used as a fertilizer in the corn field, will increase the yield almost, if not quite, to the amount of her keeping through the winter, leaving the income in eggs and chickens to make up the deficiency, if there is any, and net a balance in her favor. Hens on the farm in the summer are an advantage, as they destroy an innumerable number of insects. A hardy and quiet breed should be selected, combining as many good qualities as possible, like the Brahma, which are inclined to lay in the winter, are strong and hardy, and the Dorking, good layers, and justly celebrated as a table fowl. Other crosses, such as the Brahma and Leghorn would be desirable.

As a rule, crosses are better than thoroughbred. The stock should be renewed every two years. A fowl house opening to the east or south should be provided, light and well ventilated, but free from draughts. The perches and laying boxes ought to be moveable to permit thorough cleaning. The fowls should be made to roost in their house in order to save all the droppings. What is more wasteful and disgusting about farm buildings than to have poultry roosting any where and every where? Plenty of nutritious food is necessary and should always be provided, so that it may be easy for the fowls to get at it, and not have to work all day to fill their crops. Fifty fowls are as many as should be kept in one body, and when confined to a small space of ground it ought to be dry and ploughed, or dug over at least once in a year. There is no doubt in my mind but that with attention and care to the poultry upon the farms of this country, approximating towards that which the professional breeder gives to his birds, the products of this branch of husbandry might be doubled. As the avenues for the employment of women are few, we would suggest that in the care of poultry there are opportunities for an almost unlimited and profitable employment. We would respectfully recommend a revision of the premium list for this department, and that additional prizes be offered for Cochins and Hamburgs, together with some other varieties.

F. D. CURTIS, *Executive Officer.*

IMPLEMENTS AND MACHINERY.

The undersigned, as executive officer of Class IV, respectfully submits the following report:

That the exhibition in the department of Machinery and Agricultural Implements, was superior in many respects to that of any previous fair; especially was this true of the improvement manifest in the implements requiring power for the use of the farm and dairy.

The machinery for working wood and iron, so essential, not only to the mechanic, but to the agriculturist, was remarkable for the evidence of progress and high degree of skill which our artisans have brought to aid in the triumph of mind over matter in ministering to the comfort and well-being of the human family. The old styles of machinery, which in their time helped on the work and were prized accordingly, have mostly disappeared from my department, and new and more perfect ones have taken their places.

Of carriages and sleighs, a very elegant display was afforded, gathered from the various manufactories in the eastern portion of the State, probably never equaled at any previous exhibition, and entitled to high praise, not only for general and uniform excellence, but also for its extent and variety.

The exhibition of stoves was one of which both the Society and the manufacturers may justly be proud; competition, of course, was keen, and the judges may well be pardoned for hesitation in awards. Mention

must in justice, also be made of the exhibitors in this line, who were not competitors for prizes. Several of these devoted much time and expense to help towards the success of the exhibition.

The experience of the Society, and wants of exhibitors have clearly demonstrated that suitable provision for the exhibition of machinery run by steam power has become an absolute necessity. If accommodation for one-half more in number had been provided, the power would have been appropriated, and would have added much to the convenience of the exhibitors and the interest of the exhibition. The thanks of the Society are eminently due to Messrs. Townsend and Jackson of Albany, who furnished the elegant engine and shafting, that was the admiration of all who saw it in operation.

The judging of articles in this department, owing to the short time allowed, can never be perfect, and full justice can never be rendered to exhibitors until the Society adopts the plan of making all trials and examinations of implements and machinery before the exhibition opens. Ample time can then be taken, and the work being done deliberately, omissions and mistakes will be much less frequent. I hope the day is not far distant, when the Society will be permanently located, and the plan of preliminary trial thoroughly tested, and I have no doubt but great good will be the result.

I desire to thank the Judges, Superintendents, and others, who assisted me at the late Fair, for the able and thorough manner in which they performed their duties.

JAMES GEDDES,
Executive Officer in charge.

GRAIN AND VEGETABLES.

In again presenting the annual exhibit of the department of the Fair of the State Agricultural Society under my charge, no new features are to be particularly noticed, and I much regret that in a year so favorable as has been the present one for the growth and maturing of roots and cereals, and at a locality so easy of access as were the grounds of the Society this year at Albany, that the display of farm products was not more general and magnificent.

While the exhibition in this department, as a whole, was not what might reasonably have been anticipated from the farmers of the State, yet evidence accumulated daily to those in charge that it was no unimportant feature of the general exhibition. All of the samples presented were of superior merit, and shown in fine condition.

The exhibitors, many of whom have followed us from year to year, are, as a class, second to none in their fealty to the Society, and are entitled to commendation for their uniform courtesy to the officials, and for the promptness and candor with which they comply with the Society's regulations.

Various modes and practices in tillage husbandry reported as being in use by the several exhibitors, were socially and fully discussed, examined and compared. Many of the discussions were taken up at a point where they had been dropped at a former exhibition; and from careful observation, I am led to believe that this department is a reliable bureau of information upon topics pertinent thereto. Personally, I am under large obligations for the many valuable lessons there learned.

Whole farming communities have been piteously humbugged by the introduction of well advertised, and so-called new, varieties of grain. It has been the aim of those having specially in charge this department, to give the discussions here noticed such practical bias that farmers coming within the influence of them shall be put upon their guard against financial adventurers in these schemes, and they have been many times certified of the efficiency of their efforts in this direction.

On a former occasion I called the attention of the Society to what seemed to be really a want of conveniences for exhibitors in this department. Shelves, tables and platforms may be so arranged as to render the display of the products of the soil more attractive and convenient. This will all come about in good time.

Of the tens of thousands who passed through the hall, I am quite certain that comparatively few were aware that a sample of wheat was exhibited equal, if not superior, in appearance and quality to any before shown at our State Fairs, accompanied by a barrel of flour made from the crop, and full statistical information of its culture and growth, and of its manufacture into flour, giving details of its shrinkage and of its baking qualities.

Again, from actual test it was well shown that a large portion of the people attending the Fair, went to their homes, not having seen the large collection of potatoes (318 varieties), a complete and valuable exhibition in itself, unequaled heretofore any where. We may, I think, so arrange the plans of our buildings that in future, such oversights shall be rarer than now.

The indefatigable and financially unremunerative labors of Dr. Hexamer, in the cause of agricultural science, judged by results, rank him one of the benefactors of mankind, and our Society might not go far wrong in bestowing upon him its highest testimonial.

On the whole, in common with my fellow citizens, I have just reason to be gratified with the results of the display in this department, and this brief report may not close without acknowledgment of the faithfulness and competency of the judges selected to make the awards, and efficiency of the Superintendent of the department, and his assistant, as well as of the aid and encouragement rendered, and the cordial confidence vouchsafed to me by the several members of the executive board.

MILO INGALSBE,
Exec. Officer in charge.

SOUTH HARTFORD, *Nov.* 1, 1871.

DAIRY DEPARTMENT.

FRANKFORT, *November* 18, 1871.

I beg leave to submit the following report of the dairy department, as it appeared to me at the annual fair held at the city of Albany, October 2–6, 1871.

First. The exhibition of butter and cheese was meagre beyond excuse for a State show in a State having a greater amount of capital invested, and consequently a greater interest, in this branch of agriculture, than any other one interest. The few samples of butter and cheese presented were, however, of superior quality, showing what might, and should, have been done by the dairymen and dairywomen of New York.

The show being held in a part of the State, less devoted to this branch of agriculture, affords no excuse for the neglect of this important interest, and the meagreness of the exhibition in dairy products.

Second. The exhibition of honey was large, and the samples generally of beautiful quality.

Third. That of bread, cakes, crackers, etc., all that even a hungry person could desire

Fourth. Salt, in all its forms, and in its beautiful whiteness (emblematic of its purity), was exhibited by the Salt Co. of Syracuse, and during the five days of the fair, I often looked upon the Onondaga salt with pride, and have not to this day ceased to regard it as one of the saving features of the entire exhibition in my department.

In conclusion, allow me to suggest that a divorce be granted the dairy products and apparatus, from the grain and vegetable department, and that a hall of suitable size be provided where all the dairy implements may be exhibited in the same building with the dairy products, and not be scattered over the whole show ground. HARRIS LEWIS.

REPORT OF THE JUDGES OF JERSEYS.

Appointed to act as judges of Jersey cattle at your last annual exhibition, we performed the duties assigned to us to the best of our ability, and believe that the awards, if not in all cases satisfactory to rival exhibitors, will bear the test of close examination, and receive the approval of all who will take the trouble to examine each exhibited animal separately and by scale of points.

A summary of our decisions was handed to your Secretary at the time of the Fair, and we promised to forward a more formal report as soon as we could prepare it. We would accordingly respectfully submit the following remarks:

The number of animals upon which we were called to pass judgment, was eighty-three, and in addition thereto, three herds were competitors for the herd prize. It was the largest, and we believe, the finest display of Jersey cattle ever made at any of your exhibitions. There were some animals of surpassing merit, while none were discreditable to the breed, and the general average was highly satisfactory, reflecting great credit upon the breeders and exhibitors.

The great interest now taken in this breed of cattle, manifested by the steady demand, the constant importations, the high prices paid for really fine specimens, the great number exhibited, and the attention bestowed by visitors, while the animals were under examination, made us feel that our decisions would be closely watched and criticised, and that it was incumbent upon us to give to the task our closest attention and the strictest impartiality. We determined to make use of the "Scale of Points," and, although we should have preferred to have used the scale established in the Island of Jersey, we used that which your Society has introduced, and which was furnished to us for the purpose. Fortunately for us, we perfectly agreed that no fancy points (such as black switch, black tongue, self-colors, and what Col. LeCouteur, writing from Island of Jersey, alludes to when he says, "our farmers have not the *singular variety of ideas* as to the appearance and character of our breed which you describe to prevail among the members of your club") were to be taken into consideration.

We believe the standard adopted by the "Royal Jersey Agricultural Society," for judging of the merits of the cattle of their Isle, to be the correct one, and if deemed *necessary* there, where *only this breed* is known and propagated, how much more imperative should be its use with us in arriving at our decisions, our eyes being accustomed to many breeds, and our tastes perhaps biased towards some other than Jersey cattle.

Invited, as all your judges are, to make such remarks or suggestions as seem to them proper, and relative to the class they are invited to pass upon,

we would express our regret that the herd belonging to Mr. Faile did not compete for the herd prize. It was the best on exhibition, the most uniform in excellence, and contained the greatest number of high-prize winners, and it would have been gratifying to us to have awarded to it what was so manifestly its due.

We assumed that the pedigrees of all the animals had been approved by your board, and therefore put all entries on an equality in this respect, although there were some few fine specimens of Channel Island cattle, which seemed to us to partake of some of the peculiarities of the Guernsey as well as of the Jersey breed.

While believing that the only correct, impartial, and to all concerned the most satisfactory method of judging cattle is by using the "Scale of Points," we do not entirely approve of the scale in use for Jerseys by your Society, and would respectfully submit that in our opinion the scale established in the Island of Jersey should be adopted. It gives *one* mark for *excellence* in each point, and *nothing unless excellent*, and requires an animal, to entitle it to a prize, to receive a given number of marks. By your system an animal may be above mediocrity in all points, but *excellent* in very few, and yet win a prize. This could not occur in the Island of Jersey. Thirty-three points are there allowed to a bull, and none can obtain a prize which is not pronounced by judges *excellent* in twenty-seven points. To cows, thirty-six points are allowed, and to obtain a prize a cow must be *excellent* in twenty-nine.

In your scale moreover, you allow of *different degrees of excellence in pedigrees*. This seems to us entirely wrong. You adopt ten as the highest mark for excellence in pedigree on the side of the male, and the same on side of the female ascestor. Now, an animal either has a perfect pedigree or it has not. If perfect, all animals *must* receive ten points. If not perfect, the animal cannot be passed upon as a *thoroughbred*, and therefore has no place in the judges' ring.

As we have stated above, no pedigrees were submitted to us. We assumed that your executive board had passed upon them before allowing the animals to compete, and we therefore gave to each the same number of points for pedigree, viz., your number—ten. We submit whether it is not better to drop these two items,

"Pedigree on male side—ten.

"Pedigree on female side—ten,"

from your scale.

We would further suggest that, in order to facilitate the examination of stock, where the number exhibited is too large to admit of all in any one class being judged carefully by points in one day, a division be made, and two sets of judges be selected, so that the work may be got through with, and prizes announced before the opening of Fair on the second day. It might prove satisfactory to owners, it certainly would prove instructive to visitors and breeders, to have a card, with the points of excellence allowed by judges, put up on the stall of each prize winner, during the remainder of the Fair. This would expose the decisions of judges to much criticism; but this very criticism would be profitable to all—as well to judges as to such visitors and breeders as were interested in the subject.

Before concluding this somewhat lengthy report, we would express our appreciation of the uniform courtesy and polite attention shown to us by all the officers and employes of the Society with whom our duties brought us in contact—duties which occupied the entire days, Tuesday and Wednesday, and a portion of Thursday.

Respectfully submitted.

JOHN HAVEN,
C. I. HAYES,
Judges.

POINTS ADJUDGED TO JERSEY COWS OVER THREE YEARS OLD.

Catalogue Number.		258	257	252	254	250	251	253	255	256	248	245	247	243	249	246	242	244	263	261	262	259	260	239	238	240	241
Pedigree on male side	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Pedigree on female side	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Head	10	7	9	9	10	9	9	9	8	10	7	9	7	9	6	8	8	8	8	9	7	10	9	7	7	8	6
Cheek	10	8	9	8	9	9	9	9	9	9	7	9	8	9	7	9	7	7	7	9	8	10	8	7	8	8	7
Throat	10	8	8	9	8	9	7	7	9	9	9	9	8	9	7	9	8	7	9	9	7	8	7	8	7	7	6
Muzzle	10	7	7	9	8	9	10	10	8	10	8	9	7	9	6	7	8	8	8	9	8	10	9	9	8	9	5
Nostrils	10	9	10	10	9	9	10	8	8	10	8	8	7	8	6	8	9	7	7	8	8	9	10	8	8	10	8
Horns	10	8	9	8	7	9	10	8	8	9	6	8	8	7	6	8	9	8	10	9	9	10	9	9	9	8	8
Ears	10	8	8	8	8	10	8	7	7	9	8	8	7	7	6	9	8	7	8	9	7	9	8	8	9	8	7
Ears, color	10	9	8	10	8	8	9	8	9	10	10	10	9	8	10	10	10	10	9	10	9	10	9	10	10	10	10
Eye	10	8	9	9	9	10	9	10	9	10	8	8	9	9	9	8	8	9	8	9	8	9	9	9	8	7	9
Neck	10	9	8	8	9	10	9	8	8	10	9	8	8	7	6	9	8	7	8	8	9	9	9	9	9	8	8
Chest	10	8	8	10	9	10	9	9	8	10	8	7	7	7	7	8	9	7	7	8	8	9	8	9	9	9	9
Barrel	10	7	8	8	9	10	8	7	8	9	8	8	7	7	8	9	9	7	8	8	7	9	8	8	7	9	7
Well-ribbed	10	8	7	10	10	8	7	7	9	8	7	6	5	6	8	8	7	8	7	8	7	7	8	8	9	8	7
Back, withers to hip	10	10	7	10	8	10	9	8	9	9	10	9	7	7	10	7	7	8	9	7	9	10	10	10	9	9	8
Back, from hips and setting of tail	10	6	7	8	8	9	8	8	7	9	6	8	8	9	6	7	9	6	6	5	8	6	7	7	9	9	9
Tail fine	10	8	6	8	8	9	10	10	10	8	9	10	9	7	8	6	7	10	7	6	6	7	7	7	8	7	6
Tail, down to the hooks	10	9	8	9	7	9	10	10	9	9	9	10	9	8	9	9	4	10	8	9	9	8	8	8	8	6	4
Hide	10	8	7	8	9	10	9	8	8	9	5	7	8	7	9	7	9	7	7	7	6	9	7	7	9	7	7
Hair	10	8	7	8	9	10	9	8	8	8	7	7	8	8	8	8	8	8	7	7	7	8	8	8	8	8	8
Color of hide	10	7	7	10	7	8	9	7	10	9	9	7	9	8	9	8	9	8	8	9	6	8	8	9	9	9	9
Fore legs	10	7	8	9	8	9	9	8	8	9	8	8	8	7	8	7	9	8	6	8	9	9	8	9	8	9	8
Fore-arm	10	7	8	9	8	9	10	7	7	8	6	8	7	7	6	7	9	8	7	8	9	9	8	9	8	9	8
Hind quarters	10	7	8	10	9	10	8	7	8	9	7	9	9	7	5	9	9	8	7	5	7	8	8	9	9	8	10
Hind legs	10	8	8	9	9	9	9	9	9	9	4	8	9	6	7	7	8	8	6	5	8	9	8	9	7	9	7
Hind legs, position of	10	8	8	9	10	9	9	7	9	9	4	8	6	6	8	8	9	9	6	5	8	9	9	9	9	9	9
Hind legs not to cross when walking	10	7	8	9	9	10	8	7	8	9	6	8	6	6	8	8	9	9	7	6	8	9	9	9	9	9	9
Hoofs	10	8	8	9	9	9	9	9	9	9	8	10	6	7	9	9	9	9	9	8	9	9	9	9	9	7	9
Udder, form	10	8	7	8	7	9	8	6	8	9	6	8	7	9	7	4	8	6	7	7	7	9	9	6	10	6	9
Udder well up behind	10	8	7	7	9	10	9	6	9	9	7	8	9	9	7	5	8	4	6	8	6	7	8	9	9	7	9
Teats	10	9	8	10	8	9	8	8	9	9	7	6	8	9	9	4	9	6	8	8	7	7	7	8	7	6	8
Milk-veins	10	8	6	7	8	10	8	6	9	8	6	6	7	8	5	5	7	5	6	7	6	7	7	8	7	5	8
Growth	10	10	9	10	10	10	10	9	8	10	8	8	8	8	9	8	9	9	8	8	7	9	9	10	10	10	8
General appearance	10	7	8	9	9	10	10	8	9	10	9	9	9	8	7	7	9	7	8	5	7	10	9	9	9	8	7
Condition	10	9	9	10	10	10	10	10	10	10	10	10	10	9	10	9	10	10	9	9	9	10	10	10	10	10	9
Perfection	360	291	287	322	312	338	323	293	309	331	274	299	284	282	275	279	303	285	276	280	281	316	304	308	309	296	286

No. 258. Ira Harris, Loudonville; Monochrome.
" 257. Ira Harris, Loudonville; Leap Year.
" 252. Thomas H. Faile, Jr., New York; Edna 2d.
" 254. Thomas H. Faile, Jr., New York; Edith 3d.
" 250. Thomas H. Faile, Jr., New York; Edna.
" 251. Thomas H. Faile, Jr., New York. Flora 2d.
" 253. Thomas H. Faile, Jr., New York: Winglet.
" 255. Thomas J. Hand, Sing Sing; Lady Mary.
" 256. Thomas J. Hand, Sing Sing; Emblem.

No. 248. W. B. Dinsmore, Staatsburgh; Kitty.
" 245. W. B. Dinsmore, Staatsburgh; Hattie 2d.
" 247. W. B. Dinsmore, Staatsburgh; Rachel.
" 243. W. B. Dinsmore, Staatsburgh: Louise.
" 249. W. B. Dinsmore, Staatsburgh; Duchess.
" 246. W. B. Dinsmore, Staatsburgh; Gracie.
" 242. W. B. Dinsmore, Staatsburgh; Gipsy.
" 244. W. B. Dinsmore, Staatsburgh; Olive.
" 263. John D. Wing, Washington, N. Y.; Darkness.

No. 261. John D. Wing, Washington, N.Y.; Spring Flower.
" 262. John D. Wing, Washington, N.Y.; Frou Frou.
" 259. Dean Sage, Albany; Parepa.
" 260. Dean Sage, Albany; Pepita.
" 239. E. Corning, Jr., Albany; Maggie.
" 238. E. Corning, Jr., Albany; Sophia.
" 240. E. Corning, Jr., Albany, Cream Violet.
" 241. E. Corning, Jr., Albany; Violet.

POINTS ADJUDGED TO TWO YEAR OLD JERSEY HEIFERS AND BULLS.

		Heifers.											Bulls.			
Catalogue Number.		272	270	271	264	265	272 A	272 B	268	269	266	267		225	224	222
Pedigree on male side	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Pedigree on female side	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Head	10	10	9	10	9	8	10	7	9	9	9	8	10	8	6	8
Forehead broad		....	....	....	....	....	....		....	....	....	....	10	6	10	8
Cheek	10	8	7	9	7	8	9	8	9	9	9	9	10	8	7	8
Throat	10	7	8	8	7	7	9	8	8	9	10	8	10	5	6	7
Muzzle	10	9	10	10	9	9	9	5	10	9	9	9	10	6	8	7
Nostrils	10	10	10	10	9	9	8	8	10	10	8	8	10	10	10	10
Horns	10	8	8	9	10	9	9	8	8	9	7	8	10	8	5	8
Ears	10	9	9	9	8	8	6	6	9	9	7	7	10	10	10	8
Ears, color	10	9	9	10	10	9	9	8	10	8	8	8	10	8	8	6
Eye	10	10	9	10	10	10	10	9	8	9	10	7	10	10	8	8
Neck	10	7	9	10	7	8	8	8	10	8	9	7	10	9	8	7
Chest	10	8	9	9	10	9	8	8	8	9	8	7	10	8	8	9
Barrel	10	8	9	8	9	9	7	8	7	8	8	8	10	7	8	10
Well-ribbed home	10	8	9	9	7	7	8	7	8	7	7	7	10	6	7	10
Back, withers to hip	10	9	8	10	9	9	10	10	10	8	9	7	10	10	10	10
Back, from hips and setting of tail	10	7	8	8	8	8	7	7	7	8	7	9	10	8	8	7
Tail	10	8	9	10	9	9	9	5	8	9	10	8	10	10	7	8
Tail, down to the hocks	10	9	8	8	9	9	8	8	9	9	10	9	10	10	10	10
Hide	10	8	7	8	7	8	5	7	7	8	7	7	10	10	10	10
Hair	10	8	8	9	7	7	8	7	8	8	8	7	10	10	8	9
Color of hide	10	8	9	9	10	9	8	8	9	8	7	7	10	7	9	9
Fore legs	10	7	8	8	10	8	9	7	9	8	9	8	10	10	6	7
Fore-arm	10	7	9	8	10	9	7	7	9	8	8	8	10	6	8	10
Hind quarters	10	7	9	9	7	8	7	8	8	9	7	7	10	4	8	8
Hind legs	10	7	9	9	9	8	8	7	8	9	9	8	10	7	8	10
Hind legs, position of	10	8	9	9	8	8	7	9	8	10	9	8	10	8	9	10
Hind legs not to cross when walking,	10	8	9	9	8	9	8	9	9	9	9	8	10	10	10	10
Hoofs	10	9	9	9	9	9	10	9	10	10	9	9	10	10	10	10
Growth	10	9	10	10	8	9	9	9	9	9	9	8	10	8	10	9
General appearance	10	10	9	10	8	9	8	6	8	8	8	7	10	10	10	10
Condition	10	10	10	10	10	10	9	8	10	10	10	8	10	10	10	10
Perfection	320	270	283	294	278	276	267	249	280	281	274	254	330	277	280	291

No. 272. Thomas H. Faile, Jr., New York; Edna 3d.
No. 270. Thomas H. Faile, Jr., New York; Topsy 3d.
No. 271. Thomas H. Faile, Jr., New York; Edith 4th.
No. 264. E. Corning, Jr., Albany; Jessie.
No. 265. F. D. Curtis, Charlton; Caroline 2d.
No. 272 a. W. M. Holmes, Greenwich; Tawney.
No. 272 b. W. M. Holmes, Greenwich; Foxy.
No. 268. W. B. Dinsmore, Staatsburgh; Rachel 2d.
No. 269. W. B. Dinsmore, Staatsburgh; Phœbe 3d.
No. 266. W. B. Dinsmore, Staatsburgh; Josephine 2d.
No. 267. W. B. Dinsmore, Staatsburgh; Minnie 2d.
No. 225. Thomas H. Faile, Jr., New York; Mercury.
No. 224. W. B. Dinsmore, Staatsburgh; Emperor.
No. 223. E. Corning, Jr., Albany; Butler.

N. B.—The judges did not hand in judgment by scale of points, except for cows over three years, two-year-old heifers and two-year-old bulls.

1872. Jan. 25

THE JOURNAL

OF

The New-York State Agricultural Society.

VOL. XXI.] ALBANY, NOV. AND DEC., 1871. [NOS. 11 & 12.

OFFICERS FOR 1871.

President—RICHARD CHURCH, Belvidere, Allegany county.

VICE-PRESIDENTS.

1st district—THOMAS H. FAILE, JR., 130 Water st., New York.
2d district—EDWIN THORNE, Millbrook, Dutchess county.
3d district—JURIAN WINNE, Bethlehem Centre, Albany county.
4th district—FRANK D. CURTIS, Charlton, Saratoga county.
5th district—JAMES GEDDES, Fairmount, Onondaga county.
6th district—WILLIAM M. ELY, Binghamton, Broome county.
7th district—BENJAMIN F. ANGEL, Geneseo, Livingston county.
8th district—HORACE S. HUNTLEY, Little Valley, Cattaraugus county.

Cor. Secretary—THOMAS L. HARISON, Morley, St. Lawrence county.

Rec. Secretary—WILLIAM H. BOGART, Aurora, Cayuga county.

Treasurer—LUTHER H. TUCKER, Albany.

Executive Committee—ADIN THAYER, JR., Hoosick Falls; MILO INGALSBE, South Hartford; ROBERT J. SWAN, Geneva; HARRIS LEWIS, Frankfort; GEORGE H. BROWN, Millbrook; JOSEPH JULIAND, Bainbridge; JOHN L. COLE, Lyons; JAMES W. WADSWORTH, Geneseo.

Ex-Presidents—J. STANTON GOULD, MARSENA R. PATRICK, THOMAS H. FAILE, SAMUEL CAMPBELL, SOLON D. HUNGERFORD.

Entomologist—ASA FITCH, M. D., Salem.

Chemist to the Society—CHARLES H. PORTER, M. D., Albany.

Mechanical and Consulting Engineer—HENRY WATERMAN. Hudson.

Consulting Veterinarian—Prof. JAMES LAW, M. R. V. C., Ithaca.

State Agricultural Rooms.

The Secretary's Office is in the New Agricultural Hall corner of State and Lodge streets, Albany.

New-York State Agricultural Society.

ANNUAL MEETING.

FEBRUARY 14 and 15, 1872.

The Annual Meeting and election of officers of the New York State Agricultural Society will be held at the Capitol, in the City of Albany, on Wednesday, February 14. 1872, at noon. The Meeting will be continued as usual during the Thursday following.

WEDNESDAY. *February* 14.—Business Meeting and election at 12 M.

Evening Meeting at 7½ P. M.

Annual Address.

Report of Entomologist.

Paper on Market Fairs by Mr. X. A. WILLARD, to be followed by a discussion of the subject.

THURSDAY. *February* 15.—Meetings for discussions at 10½ A. M. and 2 P. M.

Mr. JOSEPH HARRIS, of Rochester, will present a paper on the principles upon which to decide as to the comparative value of different breeds of swine.
planting and management of woodlands.

Mr. A. S. Fuller will present a paper on Forestry, the

A discussion will follow the reading of each paper, and members are requested to be prepared to present facts within their experience and observation bearing upon these important subjects, and their views deduced therefrom.

WINTER EXHIBITION OF FRUITS, ETC. — THURSDAY, 10 A. M. TO 4 P. M.

PREMIUMS OFFERED.

Best 20 varieties of apples	$10
Second premium	5
Third premium	Thomas' Fruit Culturist.
Best 10 varieties apples	5
Second premium	3
Third premium	Trans.
Best dish of apples of any one variety	5
Second best	Trans.
Best seedling apple (subject to the rules of the Society)	5
Best collection of winter pears	10
Second premium	5
Best dish of pears of one variety	5
Best dish of grapes of one variety	5

A certificate must be given by each exhibitor that the fruits entered by him were grown by himself, and the varieties must be correctly named.

Special premiums will be given for choice fruits not mentioned above.

No premium will be given for a seedling not giving promise of proving a valuable addition to the present list of varieties.

FIELD CROPS OF 1871.

For premiums offered, see Premium list of the year. Copies will be furnished on application.

Samples of each crop entered for premium must be exhibited at the winter meeting.

EXECUTIVE MEETING.

December 20.—Present, Vice-Presidents Faile, Thorne, Winne, Curtis and Geddes; the Treasurer; the Corresponding Secretary; Messrs. Ingalsbe, Thayer and Juliand, of the Executive Committee, and Ex-Presidents Gould, Patrick, Campbell and Hungerford.

Letters and excuses for non-attendance were received from the President; Vice-Presidents Angel and Huntley; the Recording Secretary; Messrs. Swan, Lewis, Brown and Cole, of the Executive Committee, and from Ex-President Faile

Communications were received from Mr. Henry D. Emery requesting such volumes of the Society's Transactions as could be supplied towards replacing his set, destroyed in the Prairie Farmer office, and which the Committee directed the Secretary to send accordingly; from John Ralston & Co., of New York, in relation to the importance of increasing the use of artificial manures; and from the Trustees of the American Museum of Natural History, Central Park, New York City, giving notice that Mondays and Tuesdays of each week are now reserved for the use of the Museum by students of natural science, and enclosing tickets of admission for those days.

The thanks of the Executive Committee were voted to Mr. Charles Downing for his gift of models of fruits, prepared by M. Townend Glover, of the Agricultural Department. Washington, from specimens selected by Mr. Downing.

Messrs. Swan, Tucker and the Corresponding Secretary were appointed a Committee to examine and report upon Mr Alexander Jemmett's system of Farm Book-keeping and records

On motion, it was referred to the Treasurer and Secretary to draw up a new rule requiring exhibitors of thoroughbred stock to furnish full descriptions and pedigrees of their animals as a condition of entry, or to report such amendments to existing rules as may accomplish the same object.

The Treasurer presented a statement of receipts and payments on account of the Albany Fair, to date, as follows:

Receipts for tickets sold	$29 305 39
" for fines	132 85
" for annual memberships	792 00
" for life memberships	279 00
	$30,509 24

Payments for buildings, etc., in excess of subscription and refreshment rentals	$2,820 42
Premiums and expenses to date	15,168 02
	$17,988 44

Ex-President Faile, Mr. Brown and the Treasurer were appointed a Finance Committee. Ex-President Gould, the Treasurer, and Corresponding Secretary, Committee of Arrangements for the Annual Meeting; and the following Committee to consider and report on the subject of obtaining a Fair ground with permanent buildings, and to devise ways and means therefor, viz.: Ex-President Faile, Vice-President Geddes, Mr. Brown, the Treasurer, and the Corresponding Secretary.

CORRECTIONS.

The award to Daniel E. Paris & Co., Troy, N. Y., Class IV, No. 21 of first prize for cooking stoves for wood, was for the Mansard Cook, largest oven cook stove for burning wood, with galvanized cast iron reservoir and warming closet, $55; and not for the "Guard" stove, as stated in the last JOURNAL.

A. P. Bussey, Westernville, N. Y., Class IV, No. 18, was awarded a certificate of highest merit for milk deodorizer and cooler, instead of certificate of merit.

SPLENIC APOPLEXY IN COWS.

By PROFESSOR LAW, Cornell University.

On September 2d, in answer to a telegram, I visited the farm of Mr. Harbeck, near Albany, to investigate the causes of the recent fatality among his cows. The owner informed me that the malady broke out early in August, the first victim having died on the 7th of that month. A second victim perished on the next day—Tuesday. This was followed by a week's immunity; but as a third cow was attacked and died on August 16th, the pasture and water were changed by turning the survivors into another field sloping to the creek, to which they now had access for drink; but in spite of this, thirteen more fell victims in the course of the next eight days; and as if the force of the morbid cause had been meanwhile accumulating, ten of these deaths took place on the concluding day of the eight—August 24th. Thus 16 cows had died in 18 days, and the fatality seemed to be increasing. Four only of the cows which had been attacked, had survived. At the time of my visit, two of these had completely recovered, while two were in advanced convalescence—one of these having contracted inflammation of the lungs from the exudation into their substance. Two more cows which showed hurried breathing, were found to have their temperature increased by about two degrees; and had the visible mucous membranes tinged of a brownish yellow, evidently the result of slight infection.

The account furnished of the state of the carcases of those that died, as well as the sudden fatality after the disease was contracted, pointed to *splenic apoplexy* as the cause. The blood, though coagulating firmly, was diffused throughout the capillaries and smaller vessels, giving a general congested appearance to the tissues, and at certain points, its elements had passed out through the walls of the vessels and stained the different textures. The spleen (milt) was observed to be considerably enlarged, soft and easily torn, appearing but as a bag distended to the utmost with black blood.

An examination of the field where the cows had first pastured, tended only to confirm this conviction. This was on the slope of a hill, with a steep inclination to the east, the surface soil being mainly a rich loam, lying on a substratum of *hard pan*, compact and impervious to water. It contained a number of springs, stagnant pools, and stretches of wet and marshy ground in spite of its sloping surface. In addition to this the summer at Albany has been unusually wet and showery, so that the extent of these wet places is much greater than usual. The margins of these pools and the marshy spots, exhaled a most unpleasant, marshy odor, and a variegated film like that caused by oil or iron lay on the surface of the water. On examination, this film presented much debris of organic matter, including oil globules, microscopical fragments of insects, and the like. Chemical tests detected the presence of a considerable amount of iron and organic matter in the water.

In connection with this outbreak, a few remarks on the general features of this malady may be opportunely offered. It is one of a class of diseases which is only too familiar to the stock owner and veterinarian in many parts of the old world and the new. In different localities, and in its various forms, it is known under the names of bloody-murrain, blood striking, blood disease, splenic apoplexy, splenitis, black quarter, black leg, black tongue, gloss-anthrax, anthrax, charbon, etc.

It attains its greatest prevalence and virulence on

wet, marshy and undrained soils, when the superficial stratum is rich in organic matters, though it is not confined to such. Hence its frequency and destructiveness in some districts of the south and west, where the effect of such soils is augmented by the tropical heats. Under such circumstances, the poison often attains an extreme virulence, and is communicable to every species of domesticated animal and even to man himself, in whom it manifests itself under the deadly form of the *malignant pustule*. This class of blood affections thus acquire an importance higher than that implied in the pecuniary loss resulting from the destruction of valuable store, breeding, or dairy stock, from the decimation of all kinds of live stock on particular farms or districts, or even from the contamination of buildings or pastures, so as to render them permanently unwholesome. On sanitary grounds, alone, it demands the attention of the physician and the public, if not of the civil authority. It shares with *glanders* and *hydrophobia* the dread quality of infecting the human system and destroying life, and in common with these, demands that measures be promptly adopted for its extinction wherever it may arise.

Fortunately the chances for the inoculation of man are not usually great, and human victims are few even in localities where the affections frequently recur. In the *first* place, the human system does not usually present that receptivity for the poison which ensures a ready contamination from a simple contact. In this respect, rabbits and the smaller ruminants show the greatest liability, then cattle, swine and horses, and lastly, chickens, dogs and human beings. Yet in conditions favoring an extreme virulence of the poison, any of these classes may suffer, and numbers, even, of human beings, are found amongst its victims. In the *second* place the exposure to the virulent liquids is not so likely as to the saliva of the mad and infuriated dog, or to the discharge from the nose of the glandered horse. The poison resides mainly in the blood contained in the vessels, or extravasated into the substance of organs which it stains or in which it forms extensive deposits. Man avoids the contact with such vitiated and manifestly unwholesome products with the true instinct of self protection, and falls a victim less frequently than would otherwise be the case.

But, after all, man too often suffers, and in localities with a rich and comparatively uncultivated soil exposed to tropical or semitropical heats, the human mortality may prove extensive. In the steppes of Southern Russia and Siberia, it prevails yearly among warm blooded animals and man to such an extent as to have acquired the name of the Siberian Boil Plague. In the rich valleys of Sicily and the Appenines, the shepherds are under the necessity of driving their flocks and herds to the mountains and dry tablelands on the return of autumn, to save them from destruction, and themselves from the possibility of a fatal inoculation. On the rich alluvial delta of the Nile, frightful outbreaks occasionally take place, numbering many human beings among their victims. In the West Indies, on different occasions, the mortality of animals and men from this cause has proved excessive. As an example, may be cited the outbreak in Saint Domingo, in 1770. A severe shock of earthquake caused great devastation in the island, an epizoöty of anthrax followed, and the unfortunate slaves of North St. Domingo suffered from a frightful famine, for the cod fishery entirely failed. The Spanish colonists, to provide sufficient food, were compelled to salt and smoke the flesh of all their cattle, dead or dying from the anthracoid malady. The consequence was that a carbuncular epidemic appeared, and in less than six weeks more than fifteen thousand black and white people had perished. The plague did not cease until the poisonous flesh was interdicted and its sale stopped by the united efforts of government and people. (Placide Justin.)

Although northern latitudes furnish no such specimens of extensive *anthrax* epidemics, yet contagion to individual men or to a limited number is by no means so rare as is supposed. On the banks of the Dee, Aberdeen, Scotland, Dr. Spence witnessed, a few years ago, the death of several members of the same family infected from the same ox. England has recently furnished quite a number of cases of malignant pustule from animal infection. In Tompkins county, N. Y., a few years ago, a man died of malignant pustule of the arm after skinning a diseased cow. In 1869, a man who had handled the carcasses of dead cows on the banks of the Green river, Mass., suffered from malignant pustule and barely escaped with his life. And during the past summer, in St. Lawrence county, N. Y., a person contracted this disease from the body of his dead cow, and communicated it to the surgeon who attended him, by an accidental scratch sustained in lancing the diseased arm. These are mostly isolated cases, yet they should be generally known as a warning against indiscriminate handling of the carcases of animals dead of this class of maladies.*

Nature of Anthrax.—Though the different forms of this generic affection appear at first sight to differ widely from each other, appearing in the *malignant pustule* to commence in an insignificant eruption, while in the more acute forms in animals it kills in a few minutes or a few hours, and without any local eruption, yet they are identical in their nature and fundamental features An organic poison is introduced into the system, and propagates itself in the vital fluids, at their expense, and ends in disorganizing them and unfitting them for the support of life. As the result of the action of this poison, the *blood* is profoundly altered. This alteration is not always so marked when the force of the poison has been such as to kill the patient suddenly, and as if by a direct shock to the nervous system. Then the blood may be rich in red globules, and in fibrine may assume a bright red color on exposure to the air and coagulate with unusual firmness; may appear, in other words, like the blood of an animal in vigorous health. But when the patient has survived the onset some days, these changes become more and more marked. The blood coagulates less readily or firmly remaining after exposure in the worst cases, but as a tarry, diffluent mass. In keeping with this is the fact of the diminution of fibrine, Leblanc and Verrier having, in different analyses, met with but 1.50 parts of this element in every thousand of anthrax blood from the cow, while Poggiale and Hering found 6.34 and 7.6 in the healthy bovine blood. The red globules, though in great amount, perhaps, if the animal has been previously plethoric, are crenated and eroded at their edges, or many of them quite broken down, and their coloring principle diffused through the liquid in crystalline forms. Exposure to the air does not brighten the color of this so much as that of healthy blood. An element of indeterminate character, of which traces are found in the healthy blood, exists in

* NOTE.—Dr. A. N. Bell, Physician to the Brooklyn City Hospital, reports over sixty cases of Malignant Pustule in man, more than half of which had occurred in New York in recent years.

great amount in this, and appears due to the destructive changes in the globules. and perhaps. also, in the fibrine. Besides these, certain adventitious elements are found in the blood in fatal cases, especially groups of organic cells (fungi) similar to those observed in Texan fever, and staff-shaped bodies or *bacteridia*. These last have been held by Davaine and others as *the essential element* of the disease, and as the sole means of its propagation. They are minute, oblong bodies, seen only with the higher powers of the microscope, in the blood of fatal cases only, and are no longer observable after that liquid has passed into putrefaction. They are found not only in the blood of the *anthrax* animal patient, but in the liquids of the *malignant pustule* of man. Davaine, and those who endorse his views, attach much importance to the fact that they have been unable to transmit the disease by inoculation with blood in which they have failed to find these objects, while such failures were never met with when they were present in the blood used. Sanson, on the other hand, has succeeded in conveying the disease from one sheep to another, though in the blood of neither were *bacteria* to be found. and from the second, to a rabbit, in whose blood, after inoculation, abundance of *bacteria* were developed. Moreover, similar bodies are found in the blood of subjects in the advanced stages of glanders, influenza, and other maladies, and in these also prove the precursors of a speedy dissolution. Thus in the present state of our knowledge, we cannot set down these as *the peculiar contagious* germ of this disease; yet if they are not so, they at least betray the irreparable work of that contagium, and the supervention of the stage of extreme virulence. They may not be *the* contagious principle. yet their presence in the blood of an anthrax patient is a sufficient proof that such blood is virulently contagious, and that the result will be fatal.

Intimately connected with these changes in the blood are the local extravasations and effusions which take place in different parts of the body. The disorganized blood deficient in plasticity, is no longer appropriate to the nutrition of the tissues, nor capable of supporting them in their healthy functions. The control naturally exerted over the passage of the blood elements out of the vessels is at an end, and these transude through their coats and accumulate in adjacent parts, causing swellings more or less extensive. This extravasation of blood from the vessels may amount to more blood staining in spots or patches, *petechiæ*, to extensive staining of particular organs, or to an extensive accumulation of loosely clotted blood in the tissue as in the common example of *black quarter*. As in the case of the blood out of the body, putrefaction rapidly sets in. gases are generated, and the part crackles under the touch. In other cases the blood is not thrown out unchanged, but a citrine yellow serous exudation accumulates in different organs, causing swellings which may be absorbed after a time, to reappear in other parts of the body. The spleen or milt, which normally presides over important changes in the blood globules, and in which the blood is long retained for this purpose, is always enlarged and gorged, sometimes even to rupture, with this impure and disintegrating blood. In many cases this engorgement or rupture of the spleen is almost the only local symptom, and to these the name of *splenic apoplexy* has been given.

The blood drawn during the last stages, as well as the dead bodies, pass rapidly into putrefaction, and exhale a most repulsive odor. A fermentative process, allied to putrefaction, has been proceeding even during life, the real virus, in the words of Virchow, acting on the blood in the manner of a *septic poison*.

The local swellings are never primarily of an inflammatory nature. They never present that branching redness, nor the fibrinous exudation which characterize that process. The redness, on the other hand, is uniform throughout the part where extravasation has taken place, and betrays a general escape of the blood and suffusion of the tissues, rather than an engorgement, and stasis of blood in the minute vessels. Inflammation may ensue as the result of the extravasation; but in the low state of vitality in the blood and in the organs weakened by the blood infiltration, it tends to a low unhealthy type, to gangrene, sloughing and loss of substance, rather than to active inflammatory action.

Causes.—That the disease is propagated by a specific *contagium* there can be no doubt; but whether this is the *bacteridia* already referred to, or some other morbid principle, may well be questioned. This morbid element rarely diffuses itself through the medium of the atmosphere, but is usually inherent in and transmissible by all parts of the body and by the bowel evacuations. The virus is most potent when derived from an animal yet living or only recently dead; yet the products of diseased beasts will long retain their virulence, and this, notwithstanding extreme changes in climate, temperature and humidity. Fat and skins retain, for a length of time, their contagious properties, and hair, brought from *Buenos Ayres*, has repeatedly induced *malignant pustule* in London. Even the heat of ordinary boiling or roasting is incapable of destroying the virus; and there is some reason to believe that the soil, where its victims have been buried too shallow. remains dangerous for months or years.

But the *contagium* presents, in different outbreaks, the greatest possible variation in intensity of action. Nothing is more common than to see isolated cases of the disease in which the poison seems not equal to the task of reproducing itself in another animal, and in other instances it attains almost the pevalence of an epizoötic.

But if we cannot state with absolute certainty what the poisonous principle is, we can at least ascertain the conditions necessary to its development, and by removing these, ward off its attacks or divest them of their power.

Among these secondary causes *plethora*, or excessive abundance and richness of blood plays an important part. In lands naturally rich and stimulated to their utmost by high farming, this cause is so apparent that it may be looked upon as it long was in England—as the essential condition of the disease. In such circumstances the ruthless destroyer selects the flower of the flock as its first victims, or at least those which at the time of seizure are improving most rapidly. But the cause is rather to be sought in the excess of nutrient elements in the blood, and of used-up organic matter provided by the abundant changes in the rapidly growing tissues, which load the vital fluid and render it specially receptive of this poison. and fitted to reproduce it. That plethora is not the essential cause is evident, since no extreme of poverty or debility is incompatible with the disease, and rapid and excessive exertions are found to favor its development. The last condition tends again to load the blood with the products of the waste of tissue, and thus agrees with the plethora of the rapidly growing or thriving animal.

The influence of *soil* is no less powerful. And yet a

great variety of soils are obnoxious to its attacks. The worst are those in which the surface soil is excessively rich in organic matter, while the subsoil is impervious to moisture and not ameliorated by drainage. Such soils kept wet and soured during one part of the year, and dried and baked at others, give off emanations, which, if not productive of the disease *de novo*, at least contribute strongly to its development. Hence its prevalence in very rich but undrained lands; in the rich river bottoms, frequently overflowed and covered with organic debris; in low, swampy lands, where drainage is virtually impossible; on the rich deltas of rivers and the like. Hence its frequency in many parts of the Southern States, and on the rich uncultured lands on the Indian reservations, rather than on our high, dry, and porous soils of the North. On many lands of this kind, thorough drainage and tillage will at once banish the enemy; and in this way many so called *dead lots*, where no stock could formerly live, have been rendered safe and valuable. Pettenkofer banished these maladies from the vicinity of Donauworth, by drainage alone, and examples of a similarly acquired immunity may be easily found in Britain and America. Wald preserved many cattle in the vicinity of Potsdam, from this constantly recurring disease, by supplying their food in-doors, and secluding them from the dangerous emanations of the pasturages.

It has thus most commonly a malarious origin; yet it must not be inferred that it is caused by the same poison as induces ague in man. It does not, when inoculated on man, produce *intermittent fever*, but *malignant pustule*. Many places where *intermittent fever* constantly prevails, present comparatively few instances of anthrax; and lastly farms, which are thoroughly underdrained, and in the highest state of cultivation, yet give birth to fatal anthrax maladies in animals. Examples of this may be found in the natural, fertile, and highly cultivated lands of *Beauce*, in France, and Northumberland and Roxburgh, in Great Britain. Deleterious emanations, of a similar kind, appear to be given off alike in the drying surface of the rich, marshy meadow, and in the fertile and heavily manured field. There is, in both, an excess of decomposing organic matter, and many of the products of decomposition are all but identical in the two cases. It is interesting to note that the water drained from subsoils was found by Frankland to abound in *nitrites*, a class of salts, which act upon the blood so as to prevent oxidation, thus checking the processes of sanguification, and bringing about a condition of the fluid closely resembling that of anthrax blood. The *nitrites* moreover cause general relaxation of the involuntary muscular fibres of the bloodvessels, and an over distension of the superficial vessels with blood, a condition favorable to transudation. But on the other hand, it is inadmissible that these salts cause the development in the animal economy of a poison capable of indefinitely reproducing itself We are led to conclude either that the *nitrites*, and other products of organic decay in such soils, produce a condition of the blood favorable to the reception and reproduction of the anthrax poison, or that there are two distinct varieties of this anthrax in animals; one with and the other without a contagious principle, the unhealthy state of the blood in the latter case, merely increasing the susceptibility to the former. Much might be said for both of these theories, between which we need not at present seek to decide.

A *high temperature* is a strongly predisposing cause, probably because of its causing rapid drying of the surface soil, and an abundant exhalation from its organic constituents. In some rich valleys, shut in from the cooling circulation of winds, and with the sun's rays reflected and intensified from the rocky hill sides, the effects are disastrous, and such valleys in the Appenines have to be yearly deserted in summer and autumn. So, too, an intensely hot summer will cause a wide-spread development of anthrax. During the broiling heats of the summer of 1870, the writer had letters announcing the unusual prevalence of these diseases in all parts of the States, from the Atlantic to the Pacific coast. If the elevated temperature is associated with frequent rains, the decomposition of organic matters in the soil is rendered more active, and a greater mortality is the result.

Musty fodder has long been charged with causing anthrax, but though it certainly impairs the general health, and renders the subject more susceptible to this as to other diseases, it cannot be fairly looked upon as a direct cause.

Symptoms.—The *period of incubation*—that which elapses between the exposure to the poison and the manifestation of the first symptoms—varies from one hour to ten or twelve days. The average is about twenty-four hours.

At the end of this period, in cases of *splenic apoplexy*, there is a shivering fit, more or less violent, but which often escapes notice. This is followed by the hot or burning stage of the fever, during which the skin and mouth feel hot, the temperature of the body is raised, the visible mucous membranes—those of the eyes, nose and mouth, assume a dusky yellowish or brownish red hue, and the muzzle is dry and hot. The breathing is short and quick, the pulse rapid and weak, and the animal shows great languor, weakness, and insensibility to surrounding objects. The head hangs low, resting, perchance, on the manger or other object, or the patient backs into a corner, steadying himself by leaning his quarters on a wall or fence. Appetite and rumination usually cease at once, the bowels become costive, and any excrement passed is dark colored, covered by a film of mucus, and often streaked with blood.

Not unfrequently, the haggard, frightened look of the eye, the frequent turning of the head toward the sides, and the uneasy movements with the feet, manifest the existence of colicy pains, and bespeak the extravasation of blood on the bowels. In such cases, bloody *fæces* are usually passed before death

In other cases, the labored breathing, the deep dark red of the mucous membranes, and the dullness on percussion and crepitating noise heard over portions of the chest, indicate effusion of blood into the lungs.

Death usually takes place in convulsions in the more rapid cases, in a few hours after seizure, so that the first sign of anything amiss is the finding of an animal dead. In the more tardy cases, death may be deferred to the seventh day. If recovery takes place, the case is liable to be complicated by inflammation of the lungs, bowels or other organs, whose functions have been impaired by the extravasation of blood into their substance.

On opening the dead bodies, blood staining or extravasations of a dark, viscous, tarry blood is met with in various organs, such as the lungs, liver, bowels, or in the parts beneath the skin. But the most constant lesion is the distension of the spleen, often to many times its natural bulk, with the same dark unhealthy blood (occasionally it is ruptured), and the engorgement of more or less of the lymphatic glands of the mesentery in the same manner.

Sometimes in place of this extravasation of blood and blood coloring matter from the vessels, a citrine yellow albuminous liquid is thrown out into the textures in different parts, and this may be suddenly reabsorbed in the course of the malady, to reappear in the same or in other parts, so that they have the character of intermittent swellings.

Such are the general characters of *splenic apoplexy*. We have not space to speak particularly of the various other forms of anthrax. Suffice it to say that the staining or swelling due to effusions or extravasations, appear in these cases in other parts of the body, as in the tongue (gloss-anthrax), on the trunk (blackquarter), in the throat (malignant angina), etc. As the disease is thus localized in superficial parts, the fever is proportionately less intense, and a fatal issue is not so certain. When the patient survives these results, an erysipelatoid inflammation in the organ affected and extensive sloughs and unhealthy sores often cause the illness to be protracted for months.

Treatment.—In a disease which too often runs its course to a fatal conclusion in a few hours, treatment is, necessarily, very unsatisfactory. When, however, the progress of the malady is slower, or when it is detected in its very earliest stages, medical interference may be successful. In very plethoric subjects depletion by bleeding or active purgation is likely to prove beneficial in reducing that excess of effete organic matter on which the poison feeds and thrives. Medicines to act moderately on the kidneys, and tonics seconded by pure air, and wholesome diet and surroundings, may then suffice to ward off the dreaded conclusion. Carbolic acid, in drachm doses, twice or thrice daily, has been recently employed and promises the best results of any agent hitherto used. It fails, as all agents must, in the worst cases; but in many milder attacks there is reason to believe that this agent possesses the power of destroying or rendering harmless the poison existing in the system. A removal from the evil influences of soil, food, etc., is, of course, an essential element in treatment.

Prevention.—This is much more satisfactory than the treatment of the sick.

The first object must be to *seclude from the poison* the animals it is desired to preserve. The separation of the sick and healthy; the thorough burial of the carcases, skin, hair, dung, etc., of the diseased; the thorough disinfection of all buildings where sick cattle have been; and the keeping of all cattle from dangerous pasturages until these have undergone an ameliorating process, are among the most prominent points to be attended to. It is true, as we have already seen, that many cases of the so-called *anthrax* do not transmit themselves by contagion; yet, on the other hand, the *contagion* often attains to extraordinary powers of transmission, and the resulting malady is so destructive to man as well as beast, that the possibility of contagion should always be present to the mind, and suitable precautions taken to prevent it.

Our next object must be to do away with those conditions which contribute to the development of the disease. *Plethora*, extreme in its character, and suddenly induced, is always dangerous in the presence of the poison; and hence in many places where the disease frequently reappears, setons of linen or hair worn in the *dewlap* are found to ensure the preservation of a greater number than on an average escape. The same object may be secured by an occasional dose of Epsom salts or of saltpetre, or other diuretic agent. Bleeding, a measure too commonly resorted to, is a very questionable policy, as a moderate blood-letting in a healthy system, only stimulates to a more rapid production of rich blood, and this new stimulus often carries this manufacture beyond the point originally attained, and thus enhances the danger.

In this connexion it is well to note that high condition in the animal, if steadily maintained, is not so dangerous as is a sudden accession of plethora. Hence even when plethora plays an important *role* in producing the disease, it is not the highest conditioned animals, but those in which blood is being most rapidly formed, that first fall victims. Hence, too, the ascertained value of oil cake in many cases where the feed is unusually short, but is likely to be followed by a period of abundance. To sustain high condition in the animals is usually safe; to allow alternations from poverty to plethora, is dangerous

Unwholesome food of all kinds should be withheld as liable to impair the digestion and other functions, to undermine the general health and predispose to this illness.

Exposure to high temperature, as when the sun's rays are intensified in a valley by reflection from the hill sides, and the absence of winds is to be feared as not only increasing malarious emanations, but inducing in the animal a febrile state which lays the system more open to the attacks of the disease. Some such places must be left during the hot season, while in others the stock may escape if allowed access to the shade of trees during the heats of the day.

Thorough underdrainage of rich, marshy soils, and of such as rest on an impervious subsoil, is the measure most commonly demanded when *anthrax* occurs enzoötically. This, together with cultivation under a rotation of crops, for several years, until the impervious subsoil has become sufficiently porous, and the surface soil has come to yield up its rich organic stores as the food of plants, will usually restore such lands to a state of salubrity. On the farm referred to in the beginning of this paper, this is the measure which should be relied on above all others, to prevent another outbreak.

As another measure of prevention applicable to animals still apparently healthy, but from a herd in which one or two have been already attacked, doses of thirty drops of carbolic acid may be given daily, together with Epsom salts or nitre sufficient to act gently on the bowels or kidneys, as the case may seem to demand. Medicinal agents, however, should never be relied on to the neglect of such measures as are calculated to remove the herd from the sphere of the evil influence of the poison, or of those agencies or circumstances which contribute to enhance its power, or to render the animal more susceptible to its attacks.

THE METRIC SYSTEM.

The following is the report of the speech, in the English House of Commons, July 26, of Mr. A. J. Beresford Hope, on the motion for the second reading of the bill for the introduction and compelling the use of the metric system of weights and measures, in the United Kingdom. The bill was thrown out on a division, seventy-seven to eighty-two:

Mr. Beresford Hope would also, with the Barons, ask for one weight and one measure—but it should be the English, not the French system. No doubt, very serious inconvenience would arise from the adoption of this measure, which would more than overbalance any theoretical advantage which might be expected from it. He noticed in the speech of the hon. gentleman, the ordinary confusion of ideas which characterized all the sayings and

most of the writings of the advocates of the metric system, confounding it with the decimal system of notation; but they had no natural connection with each other. The Standards Commission had recommended three things: first, that the metric system, if adopted, should be permissive not compulsory; second, that any bill to make it permissive, not compulsory, should be a Government measure; and, thirdly, that it should deal widely with the question as a whole. This bill, however, was directly at variance with each of these recommendations. It was compulsory, not permissive, it was a private member's bill, and it dealt with only a fragment of the question. A handbill had been sent round by some of the advocates of the metric system, which stated that the adoption of that system had been unanimously recommended by the committee of 1862, but the fact was not so. Again, it was said that its adoption had been still more recently recommended by the Royal Standards Commission. He, of course, exonerated the hon. gentleman and his right hon. friend, the member for Staffordshire, of any complicity in these mis-statements. We lived under a permissive measure now; it was somewhat defective in its machinery; but, if its machinery were made to work well, he had no doubt the common sense of the people of Engla d would pronounce in favor of it. He had every confidence, and if the hon. member for Stockport had the same confidence in his system, why should he not allow it to be fairly tried under a permissive measure? The passing of a compulsory bill implied, not only the introduction of a different system of keeping accounts, but the radical uprooting of the ideas of the people, of rich and poor alike, in reference to forms, dimensions, proportions and distances, so much so that all in this country would have to go to school again, and we should have to give up even the language of proverb, for it would be no longer possible to say, that if you gave him an inch he would take an ell. The supporters of the bill cleverly kept in the background the alteration of the measures of area, which entered into our system of land tenure and our ordnance survey, where everything was expressed in miles and acres, chains and inches, so that the proposed change would produce confusion with regard to every title-deed, every lease, and every engagement connected with the soil. Fancy bargaining with a farmer and using the terms of the new system to indicate the extent of a farm and its distance from the adjoining towns! If the members of the Chambers of Agriculture could realize the confusion that would result in buying and selling from the compulsory introduction of the metric system, they would think twice before they petitioned in its favor. He would not dwell on the infinite misery and inconvenience which would result from this change to the poorer classes, whom it would be more easy than ever to defraud with false weights and measures. The Standards Commissioners, in their fifth report, issued that morning, recapitulated their former reports, and they remarked: "Our second report bore more particularly upon the question of the introduction into this country of the metric system of weights and measures, and embodied the results of our inquiries and deliberations in several practical recommendations, having for their object the permissive use of the metric system in the United Kingdom, more especially for international transactions." In the second report thus referred to, the Commissioners said: "We are of opinion that the general introduction of the metric system should be permisive only, and not made compulsory by law after any period to be now specified, so far as relates to the use of metric weights and measures for weighing and measuring goods for sale or conveyance. Considering the great national importance of the question of the introduction of the metric system of weights and measures into this country, it appears to us essential that any measure for this object should be proposed to Parliament by the Executive Government. Considering that the Commission will very shortly enter upon the questions referred to them, relating to the system of local inspection of weights and measures throughout the United Kingdom, we are of opinion that it is expedient that no legislation should take place, with respect to the metric system, until the whole subject of the weights and measures of this kingdom be brought before Parliament in one bill." The system of local inspection was dealt with in the report just issued, and, before they had had time to read it, it was unreasonable to ask them to read the bill a second time. This paragraph occurred in the second report of the Standards Commissioners: "The Commissioners remark that in the statements introductory to the proposals for new systems in France, North Germany and India, very great stress is laid upon the discordance in the fundamental units of their customary weights and measures, as adopted in different districts of the same Empire. These reasons have no force in Great Britain and Ireland, throughout which, whatever difference may prevail as to the multiples in local use, the fundamental units, namely, the yard, the pound, the gallon, are strictly the same, based upon national standards which are constructed with the utmost skill and care, and supported by a system of inspection, which, though chargeable with imperfections, is on the whole efficient." And they add: "It is obvious that in this country, where the people are more accustomed to self-government than in other European countries, the Executive has far less power of compelling obedience to the law in all the small transactions of trade against the wishes of the public. Should an attempt be made at the present time to introduce the mertric system by legal compulsion, the Commissioners regard it as certain that very great confusion would be produced, and they think it highly probable that the attempt would be met by such an amount of resistance, active and passive, that it would totally fail." Of the permissive use of the metric system, the Commissioners further said: "Such permission, unless very carefully guarded, would lead to the most intolerable and enduring confusion, and the Commissioners expressly state their opinion that any enactment giving permission to use metric weights and measures for public sales and conveyance must be accompanied with such provisions for their form or other characteristics as will make it impossible to mistake them for weights and measures of the present imperial system. With very careful attention to these provisions, the Commissioners see no objection to the permissive introduction of weights and measures on the metric system into shops and offices of conveyance, provision being also made for inspectors' standards and powers of inspection where required." One more short quotation. The Commissioners said: "The existing imperial system has in its main features grown up spontaneously among the people, and the action of the Legislature has been limited to such practical measures as the following: The giving certainty and precision to the fundamental standards, etc. If this conjecture be correct, it tends to prove that the existing system meets the popular wants, and that it will not easily be expelled from popular use." The bases of weight and measurement now in use, adapted as they were to different purposes, commended themselves to our common sense more than the bases of the ridiculous systems which we owed to the vanity of France, and which we could not carry out without an *encore* of the French revolution. Even from a scientific point of view, our own system was not to be disparaged. In a letter to himself, written in 1868, Sir John Herschel said: "As respects a reference of our fundamental units to a natural standard, our national system is anything but the haphazard, indefensible thing it is usually represented to be. The polar axis of the earth is a much better natural unit than the quadrant of a meridian through Paris, and, dividing this into five hundred million inches, our actual imperial foot comes within a thousandth part of twelve such inches, or a geometrical foot. I have by me two foot-rules—one by a good optician, the other purchased at a good shop and none the worse for wear—which differ from each other by more than that quantity. Taking for the definition of our ounce the weight in air of one one-thousandth part of such a geometrical cubic foot of distilled water at sixty-two degrees Fahrenheit (our standard temperature) according to the rate declared in the act five of George IV., our actual imperial ounce differs from such a geometrical ounce by only seventeen-thousandth part. But if, as some later experiments seem to have shown, that rate is slightly incorrect, then according to these experiments—that is, according to the best of our actual knowledge—the weight of that bulk of water *in vacuo* at a tempera-

ture of seventy-two degrees in place of sixty-two degrees is, with absolute precision, identical with our actual imperial ounce also weighed *in vacuo*. As for our measures of capacity, one-half pint is the measure of ten ounces of water." In 1864, in a letter to *The Times* on the comparative difference of theoretical and actual standards, metric and imperial, Sir John Her chel said: "The theoretrical French metre is one ten-millionth part of the elliptical quadrant above menitoned; the theoretical litre is one-thousandth of a cubic metere, and the theoretical gramme one-millionth part of a cubic metre of distilled water at thirty-two degrees Fahrenheit. The actual error of the French legal or standard litre and gramme, or the deviation of these standards as they actually exist from their true theoretical value, is one part in two thousand seven hundred and thirty, and is consequently relatively nearly three times as gaeat as the error in our own standards of capacity and weight when referred to the earth's polar axis as their theoretical origin in the manner above stated. Our actual imperial measures of length deviate, it is true, by more than this amount from their theoretical values so defined—that is to say, by one part in one thousand." This scheme of the philosophers, therefore, broke down as a scientific experiment, as well as in practical life, and as it was proposed to introduce it compulsorily in the face of the recommendations of the Stan iards Commissioners, he moved that the bill be read a second time that day three months.

BEE CULTURE.

Paper read at the Evening Meeting, Oct. 3, 1871, by M. Quinby, of St. Johnsville.

The farmer who fails to secure his crop after his land is in condition to produce it, loses very much more than if he made no effort to raise one; and is very much in the condition of one who has changed his produce into money, and thrown it away. Or, if he obtains but one blade of grass, where two ought to grow, he fails in an important duty to his family and his country. In very much the same light—only, perhaps, a stronger one—should we look upon the man who suffered to go to waste a valuable production of his farm, that would amount to, say several hundred dollars, that might have been secured at an expense of a small part of the product, and has allowed this to continue ever since his first operation in agriculture, partly from ignorance of what was neglected, and also from lack of stimulus to inquire into facts or means of saving it.

This production—of course, I allude to honey—is brought to his very door, and would seem to demand some little effort on his part to secure it. In like manner, we are constrained to take the same view of the State or nation, that suffers millions of its wealth to be produced only to be wasted, and continues to allow it, till millions amount to billions. I do not pretend that the discovery of this waste is original with myself, but claim that I have the means to demonstrate the fact, and am in possession of some experience that ought to suggest a feasible plan to collect and save it in future. Save it as it comes to us. Nothing so much resembles the manna in Israel as the honey of the flowers. The hour it is secreted it must be taken, or it is forever too late.

In 1856, for the first time in the history of the State, one individual furnished boxes, collected and raised, and sent to N. Y. market 22,000 lbs., including weight of boxes. A few towns in Montgomery Co. furnished all. In 1858, about the same amount was sent from the same places. For the next dozen years, probably, about the same amount was sent from the same localities, in smaller lots, by different persons. But, in 1870, 25,000 lbs. was collected from about thirty square miles, under the management of one person, and sent to N. Y. market. The same season, there was sent by one line of boats, from a very small section of the Mohawk Valley, 80,000 lbs. I have the names of the first-mentioned parties engaged in raising and marketing this honey. I mention the amount, that we may base a calculation of the probable yield of a square mile. When 30 square miles produce 25,000 lbs., 47,000 square miles, the number in the State, will produce about 40,000,000 lbs.! This amount is so vast, so much more than any one supposed it possible it could be, that but few consider themselves under any obligation to examine the premises for truth or error, and yet it seems perfectly fair to take this course to make the estimate. It will be objected that all waste places, water, mountains, forests, &c., are taken in the account, and that an occasional poor season would mater ally reduce the average amount. Very well. Probably no one will say that we should subtract more than one half. We then have 20,000,000 lbs. annually to be saved. This, at prices much less than it has sold for in market, in many years, would amount to over $2,000,000! The important question now to consider is: Will it pay the farmers to take the necessary steps to collect and save it? I suppose that with the majority, there is no sort of pay but dollars and cents—and more of them than for ordinary work—that would suit our farmers. They will, as yet, hardly seek remuneration in the consciousness of good done to their fellow men, in this gathering up of the fragments that nothing be lost. Let us hope a day will dawn when such will be more generally the case.

But waiving this, let us see if it will pay in dollars and cents. I take the affirmative, provided a man brings sufficient ability to the work. If he supposes, after reading a treatise of a few pages, he can purchase his bees, and manage them as skillfully and profitably as an experienced man, he will be likely to fail. He wants practice, the same as he would if his object was to become a successful farmer, and he had never held a plough or planted a hill of potatoes. It is easily seen that the greatest amount of instruction would be insufficient to enable him to do these things skillfully without practice. Of course, it would greatly facilitate his progress, but it takes practice to give the requisite knowledge, that he may know what is required, and above all, *when* it is required, and thus be beyond the liability of being imposed upon by every itinerant patent vender, who offers to sell him a right that will secure every advantage without effort on his part. Should he, unfortunately, lack capacity to comprehend all the requirements of the business, and depend on "buying one," he had better not undertake it. Horace Greeley, much as he knows about farming, failed in keeping bees, through ignorance. He said, "they needed more care than I could give them, and run out." Had he known what they needed, he would not have begun till he was prepared. And yet, there is no branch of farming in which there is so much egotism as in this. Very many that have had three years of tolerably successful experience, think they can teach the whole science in an essay of two pages. I had this mania once myself. I had succeeded by perseverance in keeping bees for 20 successive years, and was enabled to count stands by the hundred. The yield of honey, and increase per hive, amounted in good seasons, only to $10 or $15. I was led to say much to induce people to keep bees. Many were persuaded to make the trial. A few succeeded admirably. Many failed from lack of that patient, steady perseverance—that continuous care and watchfulness so essential to success in anything. But this fact was established. It could be demonstrated that thousands and millions of pounds of honey were annually wasted, and that it would pay to collect it, even with our then limited knowledge. Bees, at this time, were kept in box hives. On the top were boxes, which, when filled, were removed, and these constituted nearly *all* the profits. For every eighty or one hundred hives, separate apiaries were established. Swarming hives had to be watched through the swarming season—six or eight weeks—but as it was impossible to tell beforehand when the season would commence, whether the middle of May, or 1st of July, it made it practically much longer. As each place must have an attendant on each fair day, it became necessary to hire help, at considerable expense, to attend to the swarms as they issued. Another difficulty was the inexperience of the help when obtained—a difficulty that attends us yet—who, however well he might succeed in hiving a swarm after seeing one hived, was wholly unprepared for emergencies that would often perplex the most experienced. It was impossible to give directions for all that might happen, consequently the profits of keeping large numbers in swarming hives were greatly diminished. Though remunerative on the whole, it was not always satisfactory.

Many times, all outside the hive appeared right, yet the colony did not thrive; while the one beside it, with no apparent difference, was prospering, and a desire to see the inside of this dark subject would often arise. There would often be hives full of combs, strong colony of bees, in good condition to winter, but too little honey. Another beside it might have three times the stores it could consume; in fact, its surplus would be a detriment to the colony, but no practicable way opened to us at that time by which it could be relieved of its excess of stores by dividing with its poor neighbor, thus benefiting both. Again, some unfortunate stock belongs to every apiary. The bees will be few and inactive; others in the same yard will be full to overflowing, while a numerous brood are daily hatching to crowd still more, and still they refuse to swarm. I am safe, I think, in saying that if we could have judiciously given this surplus population to the needy, equalized their stores, and in other ways reaped the advantage of the movable combs of to-day, our profits would have been more than doubled. All this has now been accomplished.

Some 15 years ago, the Rev. L. L. Langstroth brought before the public an improved patent movable comb hive. Understanding what bee-keepers really needed, myself and many others were willing to give it a trial, notwithstanding it was covered by a patent. I used a modified form of it as early as 1856, with all the success we had ever dreamed of at that time. It possessed so many advantages over the common box hive, that it rapidly grew into favor with all who tried it, except a few who lacked the courage to brave a sting, or the skill to manage so as to avoid it. Mr. Langstroth made a great improvement in the movable-comb hive that he patented, and when he got it before the public, he did a work to benefit bee-keepers more than anything ever before offered.

My object here is not so much to show who is entitled to the honor of discoveries in bee culture, as to show what we can make out of them now we have them. Twenty-five years ago, it was a fact pretty well established that a swarm of bees, located in a small house or room, six or eight feet square, would continue to work year after year, and seldom swarm—it was claimed, never would—and would store large quantities, a hundred-weight or more This made another thing desirable, which was that this surplus should be stored in marketable form. We shall have to accord to Jasper Hazen, of Albany Co., the credit of first bringing to the notice of the public a practical and successful method of having all this large amount of surplus stored ready for market. Yet, at our association, last winter, a gentleman claimed the idea as original with himself, and that he had communicated it to Mr. Hazen. The principle of it was simply to give room inside the hive for all the bees to work in the boxes at once, instead of being crowded outside. And this, again, when well understood, will be worth much to the State. Abundance of room has a tendency to prevent swarming. We can and do convert this tendency into a certainty. But we find that a few of the colonies will make the effort, and sometimes persevere for two or three weeks, making preparations, and during this time are less industrious than when they make no effort. Now, here arises another question. What causes operate to produce swarming? We wish to anticipate, to head off this desire. If some scientific minds would investigate this subject, and ascertain, it would be of great value to us. And may we not hope, in view of what has been accomplished, that this will be also. We want to make all swarming artificial—at least, some of us do. We do it now, can fully control it, but we have not entirely eradicated all desire on the part of the bees to do that much according to their own notions. Another advantage connected with abundant room inside the hive, and with movable combs, is the space it affords for furnishing the bees with empty combs. It will save tons of honey to the bee-keeper. The amount of honey consumed in secreting wax to fill an ordinary hive, has been computed at about 30 lbs. honey for two pounds of wax. I have never experimented enough to decide on the correctness of this, but we have ascertained that when combs are furnished the bees, and they are relieved of the necessity of manufacturing them, they will get treble the amount of honey. The honey emptying machine, that has been in use for a short time by a few pioneers in bee culture, is destined to assist more directly in the accumulation of honey than even the movable combs. Yet, all these improvements seem so intimately connected one with another, that each seems indispensable to the other. This extractor was recently brought from Europe, and is one of the good things in bee culture to be had outside a patent. There is one on exhibition on the Fair ground. Give to a good, strong colony two or three times the usual amount of combs, and when full, or nearly so, take all out—except a few that will be about full of brood—shake and brush off the bees. With a knife for the purpose, cut off the caps to the cells, put the combs in the extractor, and with a few turns the honey is thrown out. The combs are now returned to the hive for refilling. No strained honey ever obtained equals this in purity. It is perfectly free from bee bread and impurity of all kinds. Only the honey is to be tasted. Emptying in this way as fast as filled, once in four or five days or a week, the bees are always supplied with empty combs. In 1870, hives of our own, standing beside those that had to construct comb to hold honey as collected, obtained three pounds to one, ascertained by actual weighing. One hive in one week collected over 80 lbs. Mr. Root, of Medina, Ohio, from 46 hives last year, obtained up to July 6th, 5,000 lbs. One hive gave 258 lbs. A young lady, of Jefferson, Wisconsin, reports her success in one of her father's apiaries in extracting honey, as follows: "July 5th, I extracted my first half barrel, and increased the quantity each day, till July 17th, two barrels, and by the 25th filled the 10th barrel. You will bear in mind, Mr. Editor, that I was all alone, so that I not only extracted the honey, but also took out the frames and put them in again." She speaks as if this was obtained from a very few hives in this way. She further says: "This shows what can be done with bees when there is a good season and they are properly managed. I am certain that those twenty double hives, which were mostly young swarms, gave me three times as much honey as they would have given me had I not extracted the honey."

Although this yield is only medium, yet, being obtained by a young lady, it ought to encourage others to make equal or greater effort to show results of improved management. We must not take isolated, single hives only. By carefully noting results, as to numbers in a yard, we find that apiaries of from 15 to 30 produce the most in proportion, and that is as many as ordinary farmers, with their other duties, would be likely to make profitable, if equally distributed. If 500 are kept on 30 square miles, they should be equally distributed in apiaries of about that number. I think if the masses ever understand the subject thoroughly, bees enough will be kept to collect all the honey.

We will now notice the contrast between what we used to do, and what a few have done by improved management recently. Fifteen years ago, I had many more bees than I now have, and with the best management I was capable of—using box hives and boxes on top—I did not *average* more than 20 lbs. to the hive. When I furnished boxes for the honey, which I purchased of bee keepers in the vicinity, it was my practice to leave boxes to hold 24 lbs. for each thrifty stock. They were seldom all filled. I knew pretty nearly what to expect, and am well satisfied that the average through the county was less than twelve pounds to the hive of surplus, even when some isolated cases yielded fifty.

Of the box surplus *now*. Jasper Hazen, of Albany Co., reports last year that he obtained an average of 125 lbs., and in one instance 200 lbs.

A friend of mine, in an adjoining county, to whom I have alluded, furnished for market, from 300 hives, 25,000 lbs. of box honey, which sold for over $7,000.

Mr. Hildreth, of Herkimer Co., had last spring 13 hives. Some of his bees were in box hives, the rest in the improved movable comb hive. Swarming was not controlled. Had a few lessons only in the new way of managing, but had some practical knowledge of the subject. Has doubled his number, and secured in box honey fit for market over 1,400 lbs. From a single stock, he obtained one swarm, and over 200 lbs of box honey.

Mr. Underhill, of St. Johnsville, from 15 hives, nearly all movable combs, increased six, and has 1,050 lbs. of

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box honey, and over 500 extracted, in all 1,550 lbs. surplus. Of this amount, the extracted was all from two colonies. Of the box honey, one colony furnished 225 lbs. Three of the whole number did nothing, consequently 12 colonies actually gave the 1,550 lbs. surplus and swarms. This apiary was about two miles from any other bees, except ten or twelve hives scattered in the neighborhood.

To that class of farmers having no experience, or experience only with the box hive, the management of bees in this way will seem impossible. The fear of stings would be an obstacle that would seem insurmountable to thousands, that would go into the business at once if the bees were only disarmed. Allow me to say for the encouragement of the timid ones, that the danger is much more imaginary than real; that the greatest dread is with those having the least experience. Also, that we have means of subduing them and protecting ourselves from their attacks, making their management practicable and easy. We have discovered when to find them in their most amiable moods, in which we may take liberties not allowable at any other time, without compulsion. Hence we are led to hope that the time will come when all can be accomplished, without exciting their animosity. The good effect of training is shown in the Italians in a short time. We all know that heretofore the black bees were never approached, but with the intention of pillage and murder. Perhaps, if they were humanely treated for a few years, they might improve as a race, and transmit nothing vindictive or antagonistic to future generations. We, too, must train ourselves and the rising generation to go among them without this mortal dread. To do this, we must not frighten children with the idea that bees are always disposed to sting at home or abroad; that, "if you go near the hive, they'll sting you to death." A child that grows up with these impressions, without ever being stung, is nervous at sight of a bee, and ready to go into convulsions at a musketo bite, if it were only thought a bee sting. But on this point, as on many others, I must not dwell. I have pointed out lessons of experience, successes and failures. Perhaps my statements should have the more weight, as the dollar and cent interest does not appear. That the community may have more confidence in these plans, suggestions and reports, I would suggest that a committee be appointed by this Society to enquire into facts; investigate thoroughly. Ascertain, 1st, if this State does produce 20,000,000 lbs. of honey annually; 2d, if it is practicable to collect it; and, 3d, if it would be profitable; and, after due consideration, recommend some action.

MR. ROBERTSON'S ESTABLISHMENT IN VICTORIA.

This pretty station—the cream of the colony of Victoria it may be called without fear of contradiction—is about four miles from Colac, on the Western-road. The homestead is prettily situated on the side of a hill, which is tastefully and naturally studded with blackwood trees, and commands a view of the township of Colac and lake also of the same name, with Mount Gellibrand in the background—one of the prettiest views conceivable. The station comprises some 30,000 acres of rich black and chocolate soil country, subdivided into twenty-three different paddocks securely fenced, all of which are extensively furnished with splendid and costly tanks, dams and made-springs for the use of the stock during severe droughts, or else by large, deep and natural lakes of water; as well as some of them having large cow-sheds on improved principles for the housing and feeding of stock during a severe winter. To give a good idea of the magnitude of this establishment, and the expense the owner has gone to in improving this property, it may be necessary to mention that the improvements alone, as they stand, represent some £60,000, and the cost of clearing the place of rabbits up to the present time is estimated at something like between £13,000 and £14,000; and it is a strange fact, but, nevertheless, a true one, that some years back, at some station not far remote, an individual posted notices up on his property threatening to take proceedings against any person or persons found interfering with the propagation of these pests. The cattle on this property number between 8,500 and 9,000, about 6,000 of which are Mr. Robertson's own breeding, the balance store-cattle fattening for market. In one paddock are to be seen 130 pure Shorthorn cows, the pick of the min heard of that strain of blood, especially reserved to breed bulls from to keep the herd up, and supply casual customers. They consist chiefly of first-prize animals at leading shows in England, and their progeny by first-prize bulls in the Old Country as well, and are now being served by a few choice bulls bred from imported stock. The pedigrees of these cows and of the bulls are undeniable. The owner, whilst purchasing in England, never trusted to his own judgment, but bought first-prize takers, having a view to breeding bulls in course of time, knowing the value attached in the colonies to the get of stock that has passed faultless among such judges as are to be met with at first-class shows in England, Ireland and Scotland. Another paddock contains the Hereford strain of blood, equally as pure, and reserved for the same particular purpose, all being imported for their progeny. Some cows among the above lots have cost their owner over £400 at home. Next we come to the main breeding herds of cows, each different strain of blood in their respective paddocks, all of which are carefully culled yearly, any aged or otherwise objectionable beasts being thrown out, speyed and placed in the fattening paddocks. First, we will take the 900 Shorthorn cows, from which the 100 cows of similar blood are picked for breeding bulls. They form a really magnificent lot, and impress a person at once with the amount of care and judgment displayed in their selection, etc., every animal showing the rich color and peculiar points that this particular breed possesses, as well as a docile, fattening disposition. Adjoining these are to be seen the Hereford herd of cows—some 900 head—also evidently as carefully selected and cared for, and the more noticeable on account of their particular rich red color and white faces, and as being the only herd of pure Hereford cows in the colony. The greater part of the cows in each of these paddocks have splendid calves at foot, and in a majority of instances, especially amongst the Shorthorn, the colonial-bred cattle are better grown than either their imported sires or dams. In fact, taking these two different herds of breeding cows, comprising some 1,800 as a whole, that is, taking numbers and quality into consideration, they are, without doubt, not only the finest in the colonies, but probably the best in the universe as well. The same regularity and good management seems to exist with regard to the remainder of the herd. Each different class and age of each breed have their separate enclosures, which thereby enable the proprietor to work them to advantage. The heifers are not put to the bull until three years old, and the number of paddocks enables the breeder to guard against in and-in breeding, not a very easy nor unimportant matter either. The steers are all kept until a proper age, when they are fattened and sent into market, principally the Melbourne one, where they are greatly admired, and generally make very long prices. Two thousand five hundred head of prime cattle were forwarded to market from the station last year, and there are some 3,500 ready now for the coming winter of 1871. Only a few bulls have as yet been sold out of this herd, but those already disposed of have given such satisfaction that, to meet the increasing demand, it has been found necessary to increase the number usually kept for sale twofold.—*The Melbourne Argus.*

THE THEORY OF IRRIGATION.

From the *Mark Lane Express*, May 29, 1871.

Great similarity exists in the consequences arising from the destruction of forests and from land-drainage, both as they affect the temperature and humidity of the atmosphere and soil, which in their turn are, with a good show of reason, supposed to have a considerable effect upon the distribution of rainfall, though not perhaps upon the actual amount of it. It is impossible to restore the harmony of nature thus once disturbed, without allowing the lands, cleared and improved, to

revert to their original state; but as this would be detrimental rather than conducive to man's interests, it is more desirable that the balance should be restored in other ways and by other means, which, whilst counteracting the evil effects above referred to, admit of the retention of the land in its improved state of productiveness. Thus, by the artificial production of moisture in the soil by means of irrigation, the equilibrium may be restored; whilst the subsoil drainage, which has in many cases rendered a resort to irrigation necessary, is in itself essential to the proper development of cultivation by irrigation; otherwise the land, especially in heavy soils, is liable to become waterlogged, to the injury alike of the crops and the health of the neighbourhood. This latter is clearly proved in the case of rice crops, which are so notoriously injurious to health that no European can with safety sleep in their vicinity. "Not only does the population decrease where rice is grown," says Escourron Milliago, "but even the flocks are attacked by typhus." This is happily not the case where simple irrigation is adopted for the growth of grass, cereals, vegetables and other crops required in European countries generally, where proper attention is paid to subsoil drainage. The reason why land will not produce good crops in the absence of a sufficient amount of water, even though it be highly manured and otherwise well cultivated, is that moisture is essentially necessary for the admixture with the soil of those invigorating properties existing in manures, which, in the absence of that agency, would, though, mechanically mixed with the earth, remain chemically separate and distinct from it, and therefore not in such a state as to be in any way beneficial for the devolopment of growth in herbage or plants. With the assistance of water, however, the salts contained in manure are set free and eagerly unite with the soil, by which they may be said to be digested and prepared to become fit food for the nourishment of vegetation; but, even when so taken up, these salts are, during seasons of drought, held from vegetation by an iron grasp by the soil, from which moisture alone can again loosen them. Thus we see that, whilst moisture is required in order to cause a chemical combination between the constituents of the manure and the soil, it is also further required before that soil will yield up the properties thus obtained for the purposes of vegeta ion. Having now considered in what manner irrigation has been rendered a necessary adjunct to cultivation, it remains but to state briefly what steps are required for the conservancy of rainfall, in order to render it most conducive towards a restoration of that balance in nature which previous operations of man have tended so seriously to disturb. These are two—namely, the prevention of waste by storage, and the construction of channels for the proper distribution of water so collected, properly fitted with mechanical appliances for the regulation of the supply to different fields or districts as it may be required. In conclusion, it may be remarked, that the question of sewage irrigation is one entirely distinct from that of simple irrigation by means of water alone; the purposes of the one being but the application of moisture to the soil, it in no way supersedes the necessity for manuring; whilstthe former combines the application of manure with irrigation. It does not seem at all probable that the two systems will ever be carried out in conjunction; neither is it necessary that they should be combined. It is also clear that, whereas sewage irrigation is only practicable to a certain limited extent, and in localities bordering upon towns or places where a number of human habitations are congregated together, irrigation in its simple form may be adopted, to a greater or less extent, wherever land is brought under cultivation.—*The Quarterly Journal of Science.*

SHEEP BREEDING AND MANAGEMENT.

BY THE NORTHERN FARMER.

(From the Mark Lane *Express*, Nov. 1871.)

While a well-managed flock pays well every season affording ample pecuniary encouragement to its owner to preserve a high standard of excellence, by the continual infusion of new blood from the best strains in the kingdom, there are yet years exceptionally good, when the regular breeder makes a large sum over the profit ordinarily gained, by the sudden increase in value of this description of stock. The present year affords an example of this, quite striking enough to draw the attention of all connected with this branch of husbandry, either as breeders, feeders or dealers. The demand for sheep during the past six months has been unusually brisk, and prices have risen in a corresponding ratio. Now that breeders are making up their stocks for the ensuing season, it becomes actually difficult to purchase any lot with the least pretension to character without having to give a fancy price for it; and those who are fortunate enough to hold largely add very considerable to the receipts which might fairly be calculated on as the result of capital judiciously invested. In former years, when a run upon sheep occurred, the high prices were principally confined to the best breeds, but of late all descriptions have participated in the rise in value, from the scraggy mountaineer, requiring years to fatten, to the magnificent Leicester, whose native pastures are the park of a nobleman, and whose ripe maturity is attained in the brief period of twelve months. The excellent milking properties of the poorer breeds of sheep, and the valuable offspring they are thus enabled to rear when crossed with a first-class ram, is the principal reason for their gradually assuming a forward position in public estimation; this, coupled with the cheap rate at which, till now, the ewes could be bought in, and the superior quality of the mutton when of the right age, has apparently kept up a continually increasing demand, which has at length resulted in comparative scarcity, and very great increase in value.

In choosing a flock of ewes to hold over for breeding purposes, there is not the slightest occasion for having them superbly grand, faultless in symmetry, or even of extra large size, as a firmly-built, strong-loined compact ewe of but moderate bulk, while not being such a large consumer of food, is in general a much better nurse than a big-boned one, a feature in the character of a breeding flock which can scarcely be overestimated, and which no rent-paying farmer can afford to overlook. Grandly-bred, heavy-fleshed ewes are a very unsafe investment when taken from a fine soil and dry climate to land and climate slightly inferior. It takes them a full year to become acclimatised, and if not carefully attended to the first winter in the matter of food and shelter, many will die, while a considerable portion will be mere shells when the spring comes round, utterly unable to rear their lambs profitably. On the very same keep, ewes selected more for their thrifty qualities than the grandeur of their appearance, and coming from pastures scarcely so good, will do well from the day they arrive, give no trouble, and make an excellent return in money. The receipts from wool forming a very considerable item in the year's returns, and the present price being very high, those ewes possessing wool of good quality and a promise of a weighty fleece will naturally have the preference, and, being much sought after, will cost more than short-wooled

sheep in consequence. A close, firm fleece, rather than a lengthy, open one, should be the standard aimed at, the former keeping out the drenching rain much better than the latter, and preserving the skin dry and comfortable through a lengthened storm. Moreover, a close fleece is always indicative of a sound constitution, the ewe possessing it seldom being a bad doer.

In the choice of a ram much care should be exercised, as much of the future well-doing of the flock depends on his influence. Whatever his breed, let it be pure, and he will, although not distinguished for faultlessness of symmetry himself, yet be able to transmit to his progeny all the good qualities of his race. At present the run on the white-faced breeds is particularly noticeable, the sums realized at recent sales for shearling rams of this variety being something extraordinary. To some extent this preference may be traced to the superior clip of wool which can be secured from the white-faced breeds, and the high value at which it now rates; but undoubtedly the perfection of form which breeders of this class of sheep have attained, and the great weights which they can be fed up to at an early age, is the principal reason for the high position they now hold in the estimation of the public. If possible, rams should be purchased from a well-known flock, possessing the best blood, hardiness of constitution, good wool and bone, which, while not coarse, is yet of sufficient strength to carry a heavy carcass.

Rams over-fed, and so loaded with fat as to be incapable of following the ewes with any degree of activity, should be carefully avoided, as they are productive of much disappointment and very serious loss. It is unreasonable to expect that an animal whose appetite has been pampered and stimulated with a variety of fat-producing foods, until the weight of his body has become an intolerable burden, and that has been carefully sheltered from wind, rain and sun, could possibly prove as useful as one that has been fed altogether in the fields, his food principally grass, merely assisted with a little corn, roots or cabbage, according to the season, or that his progeny could be so sound and healthy. Cutting off only the points of the wool, and permitting the bulk of a whole year's growth to remain, for the purpose of covering real or imaginary defects in the formation of the animal operated on, is a disgrace to the intelligence of the age, and a blot on the character of those who practice it, which should for ever be wiped out by its immediate discontinuance. With regard to the animal which has the misfortune to be subjected to such treatment, it becomes the very refinement of cruelty—a fact that ought to be quite sufficient to secure its condemnation, even although the motives which prompted it were perfectly pure, instead of being an effort to make more money by giving an appearance of symmetry which they do not really possess. After all the trouble that has been gone to, it is the eye only that is deceived, as the moment the hand is placed upon the apparently beautifully forward and deep chest, the broad, square back, or the well-filled thighs, the truth is ascertained. There is a tell-tale bunchiness of body about the falsely-clipped sheep which can never be attained when clipped fairly, nature refusing to be improved to the extent which some men seem to think necessary. Should it so happen that a purchaser is deceived for the time being, the illusion will be quickly dispelled when the fleece is taken off the following season.

Should it be considered desirable to breed crosses, purity of blood is quite as necessary by the sire as when the blood is preserved unmixed, the first cross between two distinct breeds being invariably the most valuable. Although excellent results can be obtained by crossing, early maturity, heavy weights and high prices, yet, for the farmer who does not feed off his sheep, it is safer to preserve his flock pure, as he can command better prices for his store stock, when of a good sort, and his customers are more likely to become permanent, giving him for store stock considerably over what they would make in open market when their value as breeders is fully ascertained. The neat, bright head, neck well set on, and general elegance of contour tells well in the sale of a lot of breeding ewes when all are so nearly alike as to look as if they had been cast in a mould. There is another advantage secured when the breed is kept pure, an opportunity being afforded for disposing of a number of the rams for breeding purposes, either as lambs or hoggets, whichever age is most sought after in the district. If the farm on which they are reared is a sound one for sheep, there will be no difficulty in selling a considerable number at remunerative prices. If sold as lambs, anything over fifty shillings each will be good payment, when no expense has been incurred for extra food, and, if a good many are sold, the average price of the year's lambs will be raised to a much higher figure than could otherwise be reached. Keeping over for another year, and giving a portion of cake or corn, and selling as shearlings, is not such a certain mode of making money, it being quite possible that after all the sheep may have to be sold at butcher's price. The reason for this is simply that they are now beyond the price which the small or middling farmer will give for a ram, and coming into competition with the regular ram breeders, their customers will not purchase from an unknown flock, when for but a few pounds more, they can have a sheep whose line of descent can be traced unsullied through many generations. Rams of good blood being now to be had at a reasonable rate, there is not the same temptation to overwork them as there was in years past, and it will pay to get an extra ram, thereby reducing the number of ewes with each to a safe limit. Forty ewes are quite sufficient, when the price of an extra ram is not a consideration, and the fall of lambs will be greatly improved, both in strength and numbers. When the lambs come to be drafted, the presence of a large number of weaklings pulls down the monetary returns most vexatiously, and no effort should, therefore, be spared in endeavoring to have the entire lot as even as possible. When the ewes are with the rams, it is all important that the food should be abundant, and of a stimulating nature, if possible; a run for an hour or two each day on a piece of succulent rape, answering the latter purpose exactly. Liberal treatment at this stage has a great influence on the lambing season, the number of twins being greatly in excess of what is usully the case under less favorable conditions. A pint of corn each day, begun a few weeks previous to, and continued through, the period of service, is of immense benefit to the ram, and will be well repaid by his hardiness of constitution and unimpaired usefulness and activity. On those farms where the whole of the lambs not required as breeders are cleared off at the age of from four to six months, it is of importance to have them dropped early, February being about the best paying month of the year, providing an ample supply of food has been stored up for their use. If sheltered for the first few nights, until they have fairly strengthened and become familiar with the teat, it is amazing what a degree of cold they will endure, and how much really bad weather they will stand with impunity, and thrive all the time, if the dams have plenty of food. The young grasses and clovers hained up from the harvest to lambing time form the best milk-producing pasture the ewes can be put on after lambing, and when grazed thus early the fields are cleared in plenty of time to grow a crop of hay the same season, scarcely at all inferior to what they would have done had they been permitted to remain untouched.

If care has been taken to preserve the pastures

moderately rough, the ewes will be able to keep themselves in good condition, without the slightest assistance, until the period of gestation is far advanced; but, however well-conditioned, it is good policy to begin to give a little food in addition to the grass, at least six weeks previous to lambing time. This, besides being favorable to the health of the flock, gives the lambs strength, and they will be dropped strong and hardy, very soon getting the use of their limbs, and the weaklings or culls will be reduced to the smallest possible limit. The food given may consist of the softer varieties of turnips, such as the Pomeranian, grey stone, and yellows, together with a little sweet hay (sheep will eat no other), given in racks so constructed that there will be no waste. A good rack soon pays itself by the mere saving it effects in the consumption of the hay; and no motives of economy, however laudable in other respects, should be permitted to interfere with getting an article for this purpose of the very best construction. The object being to preserve the animals in healthy condition only, fattening foods, such as Swede turnips, cake, or corn, should be carefully avoided until they have lambed, so as to lessen the danger of casualties at that critical period. When fairly started, and the lambing season safely over, bulky food may be given without the slightest danger in as great quantity as the flock will eat, provided it is given regularly. It is in consequence of deviation from this wholesome rule that deaths occur amongst breeding ewes when suckling their lambs, and not from anything injurious in the food itself. Although there is not actually much necessity for it, if bulky food is abundant, a little crushed oats may be given daily, as it to some extent corrects the waterish nature of the grass and turnips, keeps the wool and flesh firm, and in every way aids in preserving the animals in good health.

During the period of lambing no reasonable assistance should be grudged in attending on the ewes both during the day and night, as a little extra care for a few weeks at this time will be paid over and over again by the lives saved, to say nothing of the mental satisfaction which is the invariable accompaniment of success. The feeble little creature newly ushered into the world, it may be on a night of fierce wind or rain, stands but a sorry chance of surviving, unless some friendly hand is near to remove itself and dam to a place of shelter, rendering all necessary assistance until sufficiently strengthened to be able to find the teat easily of itself. Unless constant care of this kind is exercised, a heavy percentage of the lambs will be lost, many ewes manifesting the greatest indifference to their offspring, if weak or unable to follow. This is more particularly observable in the case of twins, the first dropped being very frequently the strongest and most precocious, and the mother showing the utmost partiality to it, and neglecting the weakling if the latter is not attended to and assisted to suck until it gathers strength.

Highly-bred ewes of the white breeds, even although they may afterwards milk moderately well, are often several days before they come to their milk, the lambs in such cases maintaining only a lingering existence, and losing much of their strength before the mother is able to support them The shepherd should have milk at command during the lambing season; and if the position is isolated and the flock large, a cow should be placed at his disposal, so that he should have no reason for being absent from his post. Liberal measures of this kind—viz., plenty of assistance and abundant food—will bring their sure reward at weaning time, the number of lambs in proportion to the ewes being so vastly greater than could possibly be the case under the system of semi-neglect which must inevitably prevail when the shepherd is overworked and unprovided with the necessary aids for the successful carrying out of the extra duties devolving on him at this time.

From the period of lambing until the day of separation the ewes should never want food at will, this rule being of such importance that it cannot be urged too frequently or pointedly. When the food supply is kept up without stint, the flow of milk is uninterrupted. The lambs, having abundance ot food, never stop or recede in growth or condition; and on the day when they are turned into cash the extra price per head over other lots not so well cared for, although equally well bred, will be so great as to demonstrate without the slightest chance of mistake or evasion what system pays best—whether liberality or niggardliness.

A mistake is sometimes made by keeping a large number of sheep in one flock, whatever the size of the fields which form their pastures. If the range is large in proportion to the number of stock, the drawbacks attendant on the practice are not so noticeable; but when kept in one lot in small enclosures, there unavoidably follows a considerable amount of inconvenience and positive loss. It pays to have the fields well fenced, so that the flock cen be divided into small handy lots, as, in the first place, more stock can be kept, and the sheep are healthier on account of the grass being clean and fresh, a large flock in proportion to the acreage of a field soon rendering it foul, by being thoroughly impregnated with their droppings. Rank grass, forced up quickly from the latter cause, is a fertile source of scour; and much loss from debility, waste of condition, and death is the inevitable consequence when sheep are constantly kept on a limited range, and afforded no variety of food. The paths made by a large number of sheep following each other in succession, which is their invariable habit, become also a cause of loss, much of the land being trodden into pathways, to the utter exclusion of vegetation. For these and various other minor reasons it will be found in practice much more satisfactory to keep a flock of sheep in several small lots, rather than in one large one. In every way they are more handy to manage; and diseases of the feet or skin are much more easily combated, should they unfortunately break out or be introduced to the pastures.

There are two modes of dealing with a flock of sheep now prevalent; the one is to clear off the lambs from the mothers; and the other to hold over, place on turnips, feed liberally with the aid of concentrated food and sell when from twelve to fifteen months old, either in or out of the wool, as may be found most convenient, the shearing becoming peremptory should the sheep be held until the season is advanced. Both methods have numerous followers, the arguments adduced on each side in support of the favourite theory being nearly always sound, for the excellent reason that in practice most men find out what pays best, and adhering to a certain course of management for a number of years, become adepts in that particular branch of husbandry to which their attention has been confined.

To get rid of lambs profitably at the age of from three to five months, the land on which they are bred must necessarily be of good quality, possessing natural advantages in the way of shelter, kindliness of soil, and early spring of grass, which, combined with liber-

ality in providing extra food in early spring, make success as nearly as possibly can be a certainty. Feeding off on turnips, on the other hand, can be adopted on a much greater variety of surface, being in point of fact suited to most soils, from the deepest loam to the thin brashy soil of the moor or hillside scarcely reclaimed from a state of nature, and where, from severity of climate, it becomes absolutely imperative to have the lambs born at the very period when those reared on low-lying and shaltered farms are being converted into cash.

The possibility of bringing waste lands in situations inaccessible to other modes of reclamation into profitable culture, by means of turnips grown with portable manures and fed off with sheep, has made this subject one of national importance, and those men who have devoted their time, capital, and energies to this branch of agriculture, deserve well of their country, and should be considered in the light of its greatest benefactors. Lambs bringing highly remunerative prices from the end of April to beginning of July, the system of clearing out the whole of the season's lambs at that period has been very generally adopted on the better class of soils. the mixed system of husbandry suiting admirably, as by its means, a good bite of succulent grass can be calculated on in very early spring, when confinement to old pastures would be little better than starvation. A farm growing a considerable breadth of green crops every year, can keep a very large stock in proportion to its acreage, every season being amply provided with food. A farmer can scarcely find himself in a worse predicament than that of having more stock than he has food for. Yet, notwithstanding all danger, trouble and loss that constantly occur from overstocking, it is the large number that is most profitable. If a farm is kept understocked, so as to avoid all trouble or outlay, in providing extra food in the spring months, when vegetation is parched into dormancy by sharp frosts and chilling winds, the stock having to subsist altogether on the rough grass which was rejected in the season of plenty, it must be very good land indeed that will make capital so expended a profitable investment. Rent, taxes, and attendance run up an unavoidable bill, which will consume all the profit yielded by a light stock, leaving not even the narrowest margin for interest of money, depreciation of market value, or losses from accident and disease. My own experience is altogether in favour of a heavy stock in proportion to the acreage, it alone on the general run of farms will pay, but it cannot be sustained, unless the supply of food is abundant every day throughout the year. The grass land on a farm worked on a six or seven years' course, has not time to become poisoned by the excretions of sheep, however great the number kept, therefore when a heavy stock is kept and liberally fed, the profit is twofold, first on the animals and their produce, and second by the manurial improvement they effect on the soil on which they are fed in such large numbers, and the large quantity of external food which they consume. By the labourgrudging system, but a moderate stock can be kept even on the best land, and they are fully fed only in the height of the grass-growing season, the winter and spring being long and dreary both to the animals and their owner, instead of being the pleasantest and most cheerful period of the whole year. By growing turnips, mangolds, cabbage, tares, rape and rye in considerable quantity, and securing heavy crops by careful culture and abundant manure, a very large stock of sheep can be profitably held in proportion to the acreage—the number indeed so great as to be seen to be believed or properly understood, the soil is kept constantly improving in stamina and crop-bearing capability, and the man who has the spirit and intelligence to carry out the full feeding system, both with the land he holds and the stock he owns, will seldom fail to place himself in a position of independence. Rather than let the ewes go back in even the slightest degree when suckling their lambs, it is better to purchase a few weeks' supply of food, if there is the slightest prospect of the home-grown running short towards the end of the season. Whatever the expense it will be repaid over and over again, if by its aid the lambs are kept progressing, and not permitted either to stand still or recede. Either of the latter results will inevitably happen if the milk is suddenly shortened in quantity, by the ewes being compelled to trust wholly to the pastures for support, before growth has been sufficiently advanced to yield them a full bite. A dry April and first half of May is a very trying time for the owners of a large breeding flock, unless he has had the foresight to prepare for such an emergency ; this done, however, he tides over the period of difficulty with perfect ease, and reaps a well-earned reward in the superior condition and consequent high value of his way-going stock.

Adhering to the principle that it is the heavy stock that pays best, it becomes the duty of every farmer following this course to work out the largest possible sum for each individual member of his flock, as constant care, abundant food, and intelligent management will extract. Loss of capital on the disposal of cast ewes should be carefully avoided, as if this is permitted it seriously lowers the year's receipts, and leads to discouragement. With the high prices of late years realized for mutton of all qualities, there is no necessity for selling old ewes anything at all under the price of those purchased to take their place ; all that is required to work them up to the same, or even at times greater value, being a little attention in providing suitable food. This is best accomplished by sowing down a few acres of rich land with clovers, grasses and rape, without a corn crop, netting the sheep on this in autumn, a very few weeks on such succulent food rendering them thick fat without cake, concentrated food, or medicated mixture of any kind whatever. Assuming that the sales of old, and purchases of new ewes balance each other, and that there are no losses, but those arising from the usual casualties inseparable from the management of a large flock, the question naturally arises, what is a good average for a breeding ewe to make during the season ? To fully illustrate my ideas on this very interesting question, I shall suppose a farm of 400 acres worked on a sound system of convertible husbandry, on which there is a large dairy stock, a proportionate number of calves, yearlings, and two-year-olds, working and young horses of different ages. and a stock of 200 breeding ewes of a good kind, costing from 50s. to 60s. each, when purchased in September. I shall further suppose that the whole of the season's lambs are cleared off within six months, the first sale being made early in May, sooner if found profitable, and the final clearance made not later than the middle of August. Such a heavy stock cannot be kept without growing root and other green crops on an extensive scale, and I therefore consider that its receipts ought to come as near as is necessary for the end in view, to the highest productive powers of a good sized fairly bred flock, whose progeny, with but a few choice exceptions, is destined for the butcher at a very

early period of their existence. Although there may be considerably more births, it may yet be accounted a very successful issue if 250 lambs are sold from 200 ewes, a certain number always succumbing to curd on the stomach, hair-balls, foxes and accidental injury. The lambs being dropped early, and properly nourished from birth will be in the market when the price is at its hightest, easily realizing an average price of 32s. each. I am aware that many men do even better than this, but the figure stated is a very fair one, and will not be reached without liberality and care. The ewes largely benefited by abundant food will grow good fleeces, weighing on the round about 6 2-3rds lbs., making at 1s. 6d. a pound, 10s. for each. The total receipts stand thus:

	£	s.	d.
250 Lambs at 32s.	400	0	0
200 Fleeces at 10s.	100	0	0
No. of Ewes ....(200)	500	0	0
Average for each ewe	£2	10	0

This I consider an excellent return when a full stock is kept, and I repeat as my firm conviction that it is only the large number worked up to such good condition as to command the hightest price of the day when disposed of, that will pay.

SMUT IN WHEAT.

From the North British Agriculturist, Nov. 30, 1870.

SIR—At a recent meeting of the East Lothian Farmers' Club, when the subject for discussion was "This year's wheat crop—the ravages of insects," one of the speakers alleged that much nonsense had been spoken in the course of the debate, and, judging from what has since been spoken and heard on the subject, it is certain that such an opinion is not confined to the individual alluded to. The club meets monthly, on market days, the discussions taking place after dinner, in presence of a reporter, and the uttering of nonsense upon such occasions is not likely either to further the objects of the club or do credit to the farmers of East Lothian. In making a few remarks upon some of the subjects noticed at the meeting in question, I shall first consider the preparation of the seed and the soil for a wheat crop, as being more particularly connected with the operations of the farm at the present season of the year, and upon another occasion recur to some of the insects injurious to the wheat plant.

It has long been the practice to prepare the seed, previous to being sown, with compounds supposed to prevent smut in the succeeding crop. One kind of smut is found occupying the ear in place of grain, is round, covered with a skin (and hence, perhaps, the provincial name of "ball"), filled with blackish powder, offensive to the smell, and which is injurious to all the products of which flour is a component part. In separating the grain from the straw, the smut balls are often broken by the threshing machine, and still more frequently by the flail, and their black dust, which is seeds, may be seen adhering to the grain. There is no doubt of smut being a vegetable fungus, and that the vitality of its seeds can best be destroyed when seen on the grain by the various specifics used in preparing the seed. The accepted theory of the propagation of smut is that the seeds or spores are taken up by the roots of the wheat, and carried by its circulating fluids into the ovary of the flower, where the fungus is developed. Whatever degree of truth there may be in this theory, the experience of ages has proved, that unless the seed has been properly prepared by a preventative for smut, the crop seldom escapes injury from this fungus. The various preventatives of smut used throughout Britain are supposed to act either by washing off or destroying the vitality of its seeds adhering to the grain, and anything whatever which will effect this object without injuring the germinating powers of the wheat. may be used with safety. The "pinch or snuff," which may be called the "Durie Pickle," would undoubtedly prove an excellent preventative of smut when used as a drier to wetted wheat, but would prove too expensive at the present time. The propriety of taking precautions against smut was so impressed upon me in early life that the dressing of seed wheat was never dispensed with except in cases when a small quantity of unprepared seed was wanted to finish the sowing of a field, and in such intances only were the crops infested with smut. Wherever wheat is extensively grown, a few smutted ears may occasionally be seen, but the farmer who neglects to use one of the simple and inexpensive preventatives of smut may justly be considered as foolhardy. In former times, when seed wheat in this country was dressed with liquids injurious to vegetation, such as stale urine and strong saline pickle, the life germ of the seed was often weakened, if not entirely destroyed, and more especially when the wheat was of a previous year's growth, arising, no doubt, from the increased absorbent powers and weakened vitality of the old seed. Ears of smut balls and ears of perfect grain are often found on the same plant, and occasionally smut balls and perfect grain in the same ear, and more than once I have seen a grain partly smutted and partly sound.

For more than a dozen of years past I have grown experimentally on a small scale many new varieties of wheat without using any means to prevent smut, and except in cases when a variety was first added to the collection, no smut has been found. The practice followed was to winnow the chaff from the grain with my own breath, and, over a table, to separate the good seeds from the bad with my fingers. No change of seed, soil nor of climate can be said to have taken place, and at present no deterioration can be traced in any variety.

There is another kind of smut where the grain and chaff come forth from the sheath blackened and destroyed, which is often plentiful amongst barley and oat crops, but rare amongst growing wheat, and is generally blown off by wind, and in such cases the grain is but little injured. About half a century ago this kind of smut was always present in crops of a variety of wheat then pretty extensively grown under the name of Dudgeon's Wheat, and was characterized by the flag leaf withering into a brown color when the ears appeared. More recently, a variety raised at Castlemains, Dirleton, with a club-shaped ear, inherited this defect to a considerable degree. At the present time, with careful inspection, this kind of smut may be detected all over the country.

An opinion was brought forward in debate, that land which had carried a crop of beans ought to be twice ploughed with a view to benefit the following wheat crop. The ploughing of such land twice assists the removal of couch grass and other root weeds, as well as kills the slug, or brown snail, but militates against the crop. If the question is put in the shape of whether

the wheat plant thrives best on loose or a compact soil, there will be little difference of opinion amongst practical farmers. I am, etc.,

PATRICK SHIRREFF.

HADDINGTON, *Nov.* 7, 1870.

NOTICES AND DONATIONS.

Report of an inquiry in regard to the prevalence and ravages of the Colorado Potato Beetle, in the western portion of Ontario, by William Saunders and Edmund Baynes Reed, of the Entomological Society of Ontario, Canada.

Memoirs of the Boston Society of Natural History, Vol. 2, Part 1, No. 2—on the Early Stages of Terebratulina Septentrionalis, by Edward S. Morse, Ph. D., Boston, Mass.

Six copies of the Twelfth Annual Report of the Indiana State Board of Agriculture and the report of Professor E. T. Cox, State Geologist. 1870.

From Samuel Van Vranken, Berne, N. Y., for the Museum—Abortive eggs, laid by a full grown common hen.

Statistics of Minnesota pertaining to Agriculture, Manufactures, Population, etc., for 1870. From A. C. Smith.

First Annual Report of the Noxious Insects of the State of Illinois, by William Le Baron, M. D., State Entomologist.

Bulletin of the National Association of Wool Manufacturers, July and Oct., 1871. Vol. 2, Nos. 6 and 7.

Proceedings of the Boston Society of Natural History, from June 15, 1870 to February 1, 1871. Boston, Mass.

Hovey & Co's Catalogue of Bulbs, and Floral Guide for the winter and spring garden. 1871–1872.

Twenty copies of the Twenty-fifth Annual Report of the Ohio State Board of Agriculture for the year 1870.

Twelve copies of the Transactions of the Wisconsin State Agricultural Society, for the year 1870. Vol. 9.

Three copies of the First Annual Report of the Board of Agriculture of New Hampshire.

A handy book on food and diet, in health and disease, by Charles A. Cameron, Ph. D., M. D. From the Author. Cassells, Potter & Galpin, Dublin and New York.

The Extinct and Dying-out animals of the earliest Earth Period. An address by George Ritter v. Frauenfeld; also a short report of the result of his trip from Heiligenblut over Agram, on the Plattensee; also upon the Extermination of the Rapskäfers. From the Author.

From A. J. Colvin, of Albany, specimen of Colorado flour, made at Greeley, Colorado. Specimen of Colorado Wheat, raised in Big Thompson Valley, sixty-five bushels to the acre, 1,170 bushels from eighteen acres, and specimen of Colorado Wheat grown at Laporte, Colorado Territory, on the farm of William Taylor, one and a half miles from Foot Hills, Rocky Mountains, forty bushels to the acre.

Agricultural Central Gazette for Germany, Nos. 6 and 7, Vol. 19. Berlin.

Yearly Report of the Nassau Society of Natural Philosophy, Vols. 23 and 24. Wiesbaden.

Ninth yearly Report of the Horticultural Society of Ober-Lausitz. Gorlitz.

Annals of Agriculture in the Royal Prussian States. Weekly edition, Nos. 1 to 26, 1871. Monthly editions Nos. 1 to 6, 1871. Berlin.—Through Dr. Flugel, Leipzig.

Biography of Anton Rosing, by P. Chr. Asbjornsen, Christiana

Beretning om Den Hoiere Landbrugsskole I Aas, from April 1 1866, to April 1, 1870. Three volumes.

Beretning om Ladegaardsoens Hovedgaard, for 1862 and 1868.

Bildrag til Bygning sckikkens Udvikling paa Landet i Norge. Vol. 1.

Beretning om nogle landbrugschemiske Undersogelser ved Aas hoiere Landbrugsskole, af A. Rosing, meddelt of G. Wankel.

The above are from the Royal University of Norway, Christiania.

M. G. Reynolds, Floral Guide and Gardener's Manual for 1872. Rochester, N. Y.

Oversigt overdet Kongelige Danske Videnskabernes Selskabs Forhandlinger og dets Medtemmers Arbeider, Copenhagen. No. 3, 1870 and No. 1, 1871.

Steiger's Catalogue of a selection of bound German books. E. Steiger, 22 and 24 Frankfort street, New York.

From William Bacon, Richmond, Mass. — Second Annual Report of the State Board of Health of Massachusetts; also Report of the Bureau of Statistics of Labor of Massachusetts.

Journal of the Transactions of the National Academy of Agriculture, Manufactures and Commerce, September and October, 1871. Paris, France.

Memorie del Reale Istituto Lombardo di Scienze e Lettere. Classe Di Scienze Matematiche e Naturali. Vol. 11, No. 3; Vol. 12, Nos. 1 and 2.

Reale Istituto Lombardo di Scienze e Lettere. Rendiconti Serie 2, Vol. 2; Nos. 17 to 20, 1869; Vol. 3, Nos. 1 to 20, 1870; Vol. 4, Nos. 1 to 18, 1871. Milano.

Atti della Fondazione Scientifica Cagnola. Vol. 5 Part 1 and 2, 1867–1869 and 1870; also Sopra Alcuni Recenti Studj di Chimica Organica e sull' Applicazione dei Loro Risultati all' Arte Tintoria del Dottor Luigi Gabba, Milano. From the Royal Institution of Science and Letters, Lombardy. Milan.

Thornton's Fourteenth Shorthorn Circular. A record of Shorthorn Transactions, and Catalogue of Shorthorn Cattle, for private sale. October, 1871. John Thornton, 15 Langham Place, London, W.

Ten copies of the Report of the Commissioner of Agriculture, for the year 1870. Washington D. C.

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Mar. 16

THE JOURNAL

OF

The New-York State Agricultural Society.

VOL. XXII.] ALBANY, JAN. AND FEB., 1872 [NOS. 1 & 2.

PLACES AT WHICH THE FAIRS HAVE BEEN HELD.

1841, Syracuse; 1842, Albany; 1843, Rochester; 1844, Poughkeepsie; 1845, Utica; 1846, Auburn; 1847, Saratoga; 1848, Buffalo; 1849, Syracuse; 1850, Albany; 1851, Rochester; 1852, Utica; 1853, Saratoga; 1854, New York; 1855, Elmira; 1856, Watertown; 1857, Buffalo; 1858, Syracuse; 1859, Albany; 1860, Elmira; 1861, Watertown; 1862, Rochester; 1863, Utica; 1864, Rochester; 1865, Utica; 1866, Saratoga; 1867, Buffalo; 1868, Rochester; 1869, Elmira; 1870, Utica; 1871. Albany.

State Agricultural Rooms.

The Office of the Society is in the New Agricultural Hall corner of State and Lodge streets, Albany.

ANNUAL MEETING.

Pursuant to amendment of the constitution adopted at the Annual Meeting of 1872, the Annual Meeting will hereafter be held on the Wednesday succeeding the Third Tuesday of January in each year, at the City of Albany.

Annual Meeting of 1873, January 22d.

VOLUMES OF TRANSACTIONS WANTED.

The Transactions of the Society for the years 1841, 1842, 1846, 1847, 1848, 1852, 1857, 1858, 1859, 1860, 1861, are wanted, to complete sets, and members are requested to assist in obtaining them. Other volumes will be given in exchange, or payment made in money, if preferred.

STATE FAIR. AWARD OMITTED.

The following award was omitted from the report of the Judges of Implements:

Gavit & Butler, New York, for Butler's adjustable sash .... Bronze Medal.

New-York State Agricultural Society.

EXECUTIVE MEETING.

February 18, 1872.—Present, The President, Vice-Presidents Thorne, Winne, Curtis, Geddes and Angel; the Secretaries; the Treasurer; Messrs. Thayer, Ingalsbe, Wadsworth, Juliand, Brown and Cole, of the Executive Committee, and Ex-Presidents Gould, Patrick, Faile and Hungerford.

Letters and excuses for non-attendance were received from Vice-President Faile, from Mr. Swan of the Executive Committee, and from Ex-President Campbell.

The President announced the death of Vice-President Ely, which took place at his residence, at Binghamton, on the sixth of the current month; and,

On motion of Vice-President Curtis, it was

Ordered, That a Committee be appointed to prepare a suitable minute in relation to the event.

On motion, Ex-President Allen was appointed to represent the society at the Convention of delegates

from the State Agricultural Societies and Boards of Agriculture, State Horticultural Societies and Agricultural Colleges of the United States, called by the Commissioner of Agriculture to meet at the City of Washington, on the 15th instant.

The Secretary presented a communication from the Bussey Institution, the agricultural and horticultural school recently established under the management of Harvard University, asking for volumes of the Transactions of the society for the library of the Institution; and it was

Ordered, That a set of the Transactions, from the year 1860, be granted.

The Secretary presented a communication from Mr. J. E. King, C. E assistant to the Professor of Chemistry, at the Massachusetts Agricultural College, in relation to beet sugar, with samples of sugar made from beets at that College, and requesting the aid of the society in procuring the growth of experimental crops of sugar beets at various places in the state, with a view of determining the adaptation of that industry to this state, and of having specimens of each crop grown sent to the said College for analysis; and it was

Ordered, That it be recommended to members of the society in various parts of the state to comply with the request.

The Secretary, from the committee to which Mr. Jemmett's system of Farm Accounts was referred, reported that they had examined the same, and found it a very complete and practical plan, convenient and simple, and recommended the award of the society's silver medal for the same. Which report was adopted, and the award confirmed.

On motion of Ex-President Gould, the President and Ex-Presidents of the society were designated to represent the society upon the occasion of the funeral of Ex-President Kelly.

The Secretary presented the draught of the report of the Executive Committee, and the same was read and adopted.

WEDNESDAY, *February* 14, 11 A. M —Present, the same members as on Tuesday, Mr. Lewis of the Executive Committee, and Ex-Presidents Conger and Geddes.

The committee appointed to audit the accounts of the Treasurer, reported that they had examined the same, and the accompanying vouchers, and found the same to be correct and that all the payments were duly vouched. Also, that they had had produced to them the securities as stated to be held by the society, and the bank book, showing the balance of cash in bank to the credit of the society, and had made and signed a certificate accordingly. Which report was accepted, and the Treasurer's accounts thereupon approved.

Vice-President Angel, from the committee appointed at the Tuesday meeting, reported the following resolutions:

WHEREAS, The death of the Honorable William M. Ely, Vice-President of this Society from the Sixth Judicial District, has taken place since our last meeting; therefore, be it

Resolved, That we cherish, with grateful recollections, the many amiable and excellent qualities of our late associate and friend; that his uniform courtesy and kindness, and his valuable services to the society, and as a member of this Board, have endeared him to us all; and that we deeply sympathize with his family and friends in their sad bereavement.

Resolved, That this resolution be entered upon the minutes of the society, and that a copy be forwarded to the family of the deceased.

And the resolutions were thereupon agreed to.

Mr. Brown, from the committee on veterinary work, presented the following report:

The Committee to which was referred the subject of the appointment of a veterinary surgeon, to be in the employment, or at the call of the society and its members, beg leave to report: that they would recommend the employment of a veterinary surgeon, to be subject to the call of the members of the society, and of the farmers of the state at large; that a sufficient sum should be guaranteed as gross income, from the Society and from his practice, not to exceed $1,500 a year; that a scale of prices should be fixed by the society which it should be understood that members and others are to pay; but, at the same time, no obligatory fees are to be collected, as the object is protection to the great stock interests of the state, and to make the society of more practical benefit to its members.

Which report was accepted; and, on motion, the committee was continued, and instructed to complete the details of the plan, and to correspond with members of the profession and others with a view to the selection of a fit person to be employed.

THE ANNUAL MEETING.

The New York State Agricultural Society met in the Assembly Chamber, at the City of Albany, on Wednesday, the fourteenth day of February, 1872, at twenty-five minutes after noon, the President of the Society, Richard Church, Esq , of Allegany, presiding.

The report of the Executive Committee was read by the Corresponding Secretary, as follows:

REPORT OF THE EXECUTIVE COMMITTEE.

The season of 1871, as compared with that of 1870, was alike in the extreme and long continued drought in the State of New York, but different as regards temperature, which was unusually moderate and equable. The crop of wheat was of unusual excellence, both in quantity and quality; returns of forty bushels of white winter wheat per acre having been not infrequent, and forty-five bushels being reported in one or two cases. Spring grains are, in most of the grain growing counties, reported as giving full average crops, even where there was least rain. Corn is, probably, under average; some of the best counties, as Monroe, Wyoming and Yates, reporting largely diminished yields. The hay crop is, in several counties, stated as better than the light growth of 1870, and in Cortland, as being large and of good quality; but the general tenor of the reports is, that the crop is light, though of excellent quality, and the price which it commands in almost all the districts from which returns have been received, indicates a decided deficiency. This is, however, doubtless due, in some measure, to the fact that very little old hay was carried over from the previous year.

The effects of the drought, in spite of which the grain growers have, upon the whole, made satisfactory crops, have been most felt in the dairy districts of the State; and the diminished returns from this important branch of our agriculture, must seriously impede progress, if not actually occasion distress in some counties whose marketable surplus consists chiefly of dairy products. Besides the drought which, beginning in May in a large portion of northern New York, may be said to have lasted through the growing season, there were, as an additional calamity, immense numbers of grasshoppers, which appeared so early as to inflict considerable damage upon the grass standing to be cut for hay, and afterwards devoured a large share of the grass of the pastures, besides injuring the late fields of spring grain and the corn when in the silk.

The occurrence of two successive years of drought and short hay crops, is an event which should teach the dairy farmer the wisdom of under-stocking, rather than overstocking his farm, and more especially his pastures. In fact, the evil of overstocking does not end with the

year. In 1870, pastures became very short before the end of the haying season; and, in consequence, it became necessary to feed the aftermath very early; and, the pastures not recovering, cattle were obliged to be kept upon the meadows until late in the season; hence, perhaps, as much as from any other cause, the light hay crop of 1871. Again, in many dairies, the yield of milk became inconsiderable and unprofitable early in September, and many cheese factories ceased working in that month. With pastures less heavily stocked, a moderately remunerative yield might have, in many cases, been maintained, and the loss of the most profitable month to the butter makers would not have been incurred.

The evil effects of drought upon pastures, may be mitigated by the provision of green crops to be used for soiling; or at greater, though doubtless sometimes profitable expenditure, by feeding the cows with meal; but pasture itself, the readiest and best resource of the dairyman, can not be made or purchased at the time of need.

As further showing the similarity of the seasons of 1870 and 1871, it may be mentioned that the mean rainfall of the State in those years, during the seven months beginning with April and ending with October, as given in the reports from the Agricultural Department at Washington, was, in 1870, 23.05 inches; and in 1871, 23.58 inches; the difference in favor of 1871, being only .53 of an inch. The rainfall of the same months, in 1869, was 29.79 inches; being 6.21 inches in excess of 1871, and 6 74 inches in excess of 1870. With the exception of the month of May, however, the distribution of the rainfall, during the growing season, was greatly in favor of 1871; accounting, in great measure, for the crops of spring grain being better in this than in the preceding year. Thus in May we had, in 1871, 2.57 inches of rain; in 1870, 2.05; in June, 1871. 4.18 inches; 1870, 2.93 inches; in July, 1871, 4.28 inches; 1870, 3.84 inches; in August, 1871, 5.24 inches; 1870, 3.7 inches; and although in the seven months, from April to October, 1871 had but .53 inch more rain than 1870, in the four months from April to July, 1871 had an excess over 1870 of 2.49, or say 2½ inches.

It may be further remarked, in reference to rainfall, that the meteorological records of the Agricultural Department strongly fortify the position of those of our farmers who prejudge the hay crop by the rainfall of the month of May; the rainfall, mean average for the State of New York, for this month, being recorded as in 1863, 3.66; 1864, 4.84; 1865, 4.41; 1866, 3.67; 1867, 6.69; 1868, 5.99; 1869, 3.86; 1870, 2.05; and 1871, 2.57 inches.

Of other crops and products, it is to be noted that there is an enormous yield of potatoes of usually excellent quality, and free from disease. The price is low, but not yet below remunerative rates. This, it is believed, is the first year in which potatoes of the Early Rose variety have beeen taken to market by the canal-boat load. This sort has proved not only very early, but of good quality for winter use, and a good cropper; and it is quoted at this time, in the New York market, about 20 per cent higher than the Peachblow. Hops have been a moderate crop; but prices, owing to the failure of the crop in England, have reached very high figures. There has also been a very marked advance in wool, owing to the consumption caused by the Franco-German war; but it is feared that the rise in prices was too late to be of much benefit to American farmers.

The annual cattle show and fair of the society, held this year at the city of Albany, was a marked success, and the exhibition as a whole has never been surpassed in the history of the Society.

In the cattle department, besides the usual excellent show of Short Horns and Devons, and a larger turn out of Herefords than for some years previous, there was an exhibition of Ayrshires far superior to any ever brought together in this state. In this class, competition extended beyond the limits of our own state, and some of the best animals shown were from Canada and New England. The gem of the class was the bull Mars, shown by Mr. John L. Gibb, of Quebec, while Messrs. Thompson, of Ontario, and Birnie, of Massachusetts, showed herds of great merit, and carried off a number of prizes. In Jerseys, there was not only the largest entry at any of our fairs, but the highest quality and the closest competition. Of grade cattle the number was, as usual, small; and while it must be regretted that this practically most important of all the cattle classes should be so meagre at our state fairs, it is a satisfaction to know that it is gaining at our county and local exhibitions, showing that the state is really deriving direct and substantial benefit from the efforts for which the state of New York has so long been distinguished—to improve our cattle by the introduction of pure blood.

The entry of horses was not large, but the quality of the animals on exhibition has seldom, if ever, been equalled at any of our shows. This is especially true of the roadster class, which included a large proportion of animals of the Hambletonian and other strains of the Messenger blood, as well as many derived from other valuable families. In this department, the show of breeding stock was larger than that of harness horses, and the studs of most of the eminent breeders in the state were represented.

In all the other classes of live stock, there was a good show, especially of long-woolled sheep and of Essex and Berkshire pigs.

In the department of farm produce, the exhibition was quite equal to former years; and, notwithstanding the unpropitious season, the show of fruit was very respectable. In the vegetable hall, Messrs. Reisig & Hexamer, of New Castle, showed three hundred and eighteen varieties of potatoes, an exhibition almost unique and for which the executive committee awarded the large silver medal of the society. The committee desires also to acknowledge the spirited efforts of the exhibitors in the classes of fruits and flowers, in aid of the success of that part of the exhibition, and especially of Messrs. Briggs & Brother, James Vick, C. W. Crosman, and Ellwanger & Barry, of Rochester, and Louis Menand, of Albany.

The show in the department of machinery and farm implements was stated by the vice-president in charge to be superior in many respects to that of any previous year. The interest in this part of the fair and the extent of the exhibition continue steadily to increase, and the improvement from year to year in the design and construction of the implements shown is evident to the most careless observer. The machinery shown in operation forms one of the most interesting features of the society's annual exhibitions, and this department is not only among the most popular, but one of the most useful in the show, while it is most gratifying to the officers of the society, as an evidence of appreciation of their efforts and of confidence in their impartiality, to meet here year after year the leading implement manufacturers of the country, either in person or represented by a most respectable and intelligent class of agents. In this department, thanks are especially due to Messrs. Townsend & Jackson, of Albany, who furnished, as their subscription to the expenses of the fair, the engine and all the line shafting and pulleys for driving the machinery shown in operation; and to Mr. H. R. Pierson, resident director of the New York Central and Hudson River Railroad Company, who granted the use of a locomotive boiler for the same purpose.

Messrs. Townsend & Jackson's engine, though entirely new, performed admirably from the start, and was much admired.

The county and town societies continue prosperous, and their reports in many cases give gratifying evidence of progress and improvement. Almost all appear to be well sustained and well managed. The American Dairymen's Association, which holds its annual meetings at Utica, continues to do a good work in diffusing more correct and scientific knowledge of the branch of agriculture in which its members are engaged; and the New York Dairymen's Association, established within the year, and which held its first meeting at Little Falls in January, promises to labour with equal energy and efficiency in the same field. The transactions of the latter association, and also of the American Fish Culturists' Association, at whose recent meeting at Albany very valuable papers were presented, will probably be embodied in the Transactions of this society.

The executive committee are grateful that they can report the state free from epizoötic diseases during the most of the year, a fact for which there is the more cause for gratitude since the former law for the prevention of the introduction and spread of contagious diseases of animals expired in April, 1871, by limitation, and the state legislature of that year refused to enact any law for the protection of the herds of the state. The foot and mouth disease, the prevalence of which during the season of 1870 excited much alarm, and which, it was feared, would break out anew in the spring of 1871, seems to have disappeared entirely; and fortunately, the enactments which have been made by other states, both east and west, operate to afford a partial, but most useful, protection to the state of New York against the introduction of disease.

Of diseases not epizoötic, there have been two outbreaks during the year of sufficient importance to require examination by the society. In July last, verminous bronchitis occurred in cows and calves in the neighbourhood of the village of Cuba, in the county of Allegany. This very destructive malady, caused by the presence of threadlike worms in the lungs and air passages, was very commonly supposed not to exist in America; but Professor Law reports this as the third instance of its occurrence in the state of New York brought under his personal observation. In September last, the society was informed of the existence of an obscure and fatal disease in a dairy of cows near the city of Albany, and it proved to be splenic apoplexy, a disease which has been unusually prevalent this season, and which is perhaps the most destructive and most frequent in its occurrence of all the diseases to which neat cattle are liable in this state. In the dairy referred to, sixteen cows died in eighteen days. Professor Law, to whom the executive committee return thanks for the promptness with which he responded to the call of the society, investigated this case also, and rendered all the assistance possible under the circumstances.

Of both these investigations made by Professor Law, in his capacity of consulting veterinarian to the Society, he has made copious reports, constituting valuable contributions to the knowledge of the subjects, and which have been published in the Society's monthly journal.

The Executive Committee has had under consideration the appointment of a veterinary surgeon who should reside at Albany, and be able to give more time to attending the calls of the Society and of its members than Professor Law can, consistently with due attention to his duties as Professor of Veterinary Science at Cornell University; and the subject has finally been referred to a special committee of the Executive Board. In view of the fact, that notwithstanding our enormous and constantly increasing investment in live stock, and the continual improvement in quality by which the value of individual animals is largely enhanced, there is hardly a competent regularly educated veterinarian in practice in this state outside of the principal cities, and a mere handful outside of the city of New York, it seems highly desirable that one should be employed by the Society under an arrangemement similar to that of the Royal Society of England with Professor Simonds, and the necessary expense involved would seem to be fully justified.

In this connexion, it may be mentioned that the Veterinary College of the city of New York, a regularly organized veterinary school, with a full and highly competent staff of professors, and ample accommodations for its work, has lately offered a free scholarship to the Society and to each of the state agricultural societies in the United States. The offer has been accepted, and duly announced; but no application for the nomination has been made. The fact that this institution, entitled, as it undoubtedly is, to the full confidence of the community, and with all necessary appliances for affording a special education of the highest order, should languish for want of students, is a painful evidence of the apathy of our people as regards this most important subject. The employment of an able and highly educated veterinarian by the Society, and the extension of his operations throughout the state, would, undoubtedly, have a good effect in awakening the citizens of our state to a proper sense of the usefulness of the profession, and tend to reduce very materially the annual losses of stock by disease.

Humanity, also, prompts to efforts to rescue our dumb animals from the neglect they now suffer when attacked by disease, and from what is far worse, the cruelty of empirical treatment either by their owners or by ignorant pretenders to veterinary skill.

During the past year, death has taken from the ranks of the Society some of its most prominent and useful members. The venerable ex-President, Colonel John M. Sherwood, one of the original life members of the Society, and one of the most energetic and efficient of the promoters of its work, died at Syracuse on the 16th of May last, in the 78th year of his age. In the death of ex-President, the Hon. William Kelly, which took place at Torquay, England, on the 14th of January, the Society has suffered a loss which may almost be said to be irreparable; and we may well feel as if our leader, counsellor, champion, were stricken down. The Vice-Presidency of the sixth district is vacated by the death of Mr. William M. Ely, for several years a faithful and efficient officer of the Society, whose many amiable qualities will long be remembered by his colleagues in the Executive Board.

The Executive Committee now confines itself to the bare announcement of these sad events to the Society, and will take care that fitting memorials be made.

The Executive Committee desire, also, to notice with profound regret, the deaths of Mr. Craig W. Wadsworth, of Geneseo, and of Mr. Joseph B. Lyman, of New York. Mr. Wadsworth had been a member of the Executive Board; and but for his failing health, might have taken a prominent position in the management of the Society, and as the farmer of one of the largest and best farms in the state. Mr. Lyman was a writer of great readiness and good sense upon agricultural topics, and a regular attendant at the meetings of the Society, to the interest of which he more than once had essentially contributed.

With the year 1871, the State Society completes the fortieth year of its existence. Established in 1832 by the illustrious James Le Ray de Chaumont and a noble band of men, to whose memory honour will be forever due, revived and extended in its scope by the institution of its annual cattle show and fair in 1841 by Wads-

worths, Beekman, Lenox, Van Rensselaer, Prentice, Rotch, Sherwood, Tucker. McIntyre, Livingston and their associates, the society has ever since pursued its steady course, enlisting in its ranks the most enthusiastic and intelligent agriculturists and friends of agriculture of the state, and maintaining a constant advance in the improvement of the great interest which it was established to promote. It has been asserted that the lands of the state of New York were becoming exhausted, but the errour of the statement is palpable to all acquainted with the facts, and the reports made to the agricultural department show plainly that improved returns are following as the effect of improved methods, improved seeds and improved stock. The society has outlived two charters, each for twenty years, and now enters upon a third term, this time of forty years, under the re-enactment of its charter by the legislature at its last session. What the society especially needs now, as a guaranty of its continued usefulness and prosperity, is the more active interest of its members in the management of its affairs, and their personal co-operation with the officers in the prosecution of its work and the extension of its operations.

And on motion of Ex-President, the Hon. Abraham B. Conger, the same was accepted and adopted as the report of the society to the legislature.

The Treasurer presented the following report of the receipts and expenditures during the year, viz.:

LUTHER H. TUCKER, *Treasurer, in account with The New York State Agricultural Society.*

Dr.

1872. Feb. 14.—To receipts of year to date, viz.:

Annual memberships		$814 00
Life memberships		549 00
Miscellaneous sources		59 94
State appropriation		1,706 25
State appropriation for salary of entomologist*		1,500 00
Ticket office receipts at State Fair		29,438 24
Interest account		1,027 70
Total receipts		$35,095 18
Amount on hand, per report Feb. 8, 1871, in cash	$4,474 64	
in U. S. securities	15,678 00	20,152 64
		$55,247 77

Cr.

By payments of year to date, per schedules annexed, as follows:

Premiums, &c., at winter meeting, per schedule A		$442 54
Premiums, &c., of previous years, per schedule B		818 75
Salaries and clerk hire, per schedule C		5 020 00
Incidental expenses, per schedule D		140 95
Postages, per schedule E		233 72
Library and Museum, per schedule F		285 72
Printing and stationery, per schedule G		826 43
Entomological and veterinary, per schedule H		1,725 90
State Fair expenses, per schedule I		6,350 98
Premiums, &c., at State Fair, per schedule L		7,002 02
Erections and grounds for State Fair per schedule X	$15,358 72	
In excess of subscriptions, &c.,	11,783 00	
		3,575 72
Total payments		$25,922 78

* Being for nine months of 1870, and nine months of 1871—one year and a half in all.

By cash and securities on hand at this date, viz.:

U. S. securities	$15,528 00	
Deposit with the U. S. Trust Company of New York city,	12,268 48	
Deposit with National Albany Exchange Bank	1,538 56	
		29,325 04
		$55,24[illegible]77

To which report was appended the usual certificate of the auditing committee.

And, on motion of Edwin Thorne, of Dutchess. the report was accepted.

PROCEEDINGS IN RELATION TO THE DEATH OF EX-PRESIDENT KELLY.

Ex-President Patrick addressed the Society as follows:

Mr. President—The report of the Executive Committee which has just been read in our hearing, alludes in brief, but appropriate terms, to the losses this Society has sustained within the past year, by the death of several of its most valued members.

Foremost among these, from circumstances the most prominent, stands the honored name of William Kelly; and it is fitting that we, who were so long associated with him, should not only place on record our estimate of his services in the cause of agriculture, education, and in the development of all the material resources of our country, but our appreciation of the nobility of his manhood, and the spotless purity of his character.

Gentlemen, we miss his presence here to-day, as no other of our associates could be missed, for we had learned to look for his appearance at our annual meetings with unfailing certainty. With him, fidelity to this Society was uniform, for he knew no release from the duties his conscience laid upon him.

Who, to-day, and in the future, shall take the place accorded him by universal consent, for the last fifteen or twenty years?

Recognized by all as our clearest headed business man and wisest counsellor, his self-sacrificing devotion to the best interests of the Society, had long since become so apparent to every one, that his opinions, always modestly and candidly expressed, were adopted almost without dissent.

Never putting himself forward, he shrank from no responsibility, he shunned no amount of labor, however disagreeable, that his associates imposed upon him, if his judgment and conscience approved the object to be attained.

With a delicacy and tact peculiarly his own, how often has he harmonized conflicting interests among us and put to rest disturbing elements?

Gentlemen of the Executive Committee, ex-Presidents and old officers of this Society, how often within the last eighteen years, whenever signs of a gathering storm appeared in our horizon, have our eyes turned instinctively to him, and the expression—almost stereotyped—fallen from our lips. "let us speak to Mr. Kelly about it. He will regulate all that matter quietly in the Committee of Twenty-four."

Who, from this time forward, will occupy the chair of that most important committee, over whose deliberations, year after year, and year after year he was called to preside?

But this great Society, with which he was so closely identified, and which shared so largely in his affections,

is not the only association that mourns the loss of its most trusted counsellor.

A vacant chair at many a board of trustees and directors of educational, charitable, religious, commercial and financial institutions, is to-day draped in mourning by those who loved and honored our friend as few men in our day are loved and honored.

In yonder chamber of this Capitol, where fifteen and sixteen years ago he sat as Senator, and where his ability as a statesman was conceded by all, no tongue nor pen dared ever link dishonor with the name of William Kelly: and democrat though he was, republican senators and legislators, the most distinguished for their honor, integrity and devotion to their own principles, almost daily sought his counsel and advice.

Of all the men with whom I have been associated in the great world, I have long regarded Mr. Kelly as the most unselfish. Retiring from mercantile pursuits at an age when most men who have been successful, become insane in their ambition for enormous wealth, he lived, for the last thirty years, to labor solely for the good of others, without fee or reward, as no hired clerk or salaried official could be induced to labor, adding nothing to his permanent income, but dispensing it faithfully and conscientiously, as the trustee of that All-Father whom he delighted to obey and honor.

"Is the object that appeals to me for aid, one to which Divinity, when clothed in humanity, would have stretched forth His hand?" That question answered, he asked no further, and his benefactions fell like the rain from Heaven, upon the ungrateful as freely as upon those who were thankful.

To those who have not much moved within a circle of twenty or thirty miles around Rhinebeck, the keenness of sorrow that prevades all hearts, can be little understood—for there, all knew him—"knew him but to love him, nor named him but to praise."

Everywhere as he moved among those people, his presence was hailed with pleasure, in the village streets, in the quiet churches, within the stately homes of wealth, and more than all, within the humble cottage by road side, wood and hill, where his name was a household word and his approving smile, childhood's most coveted reward.

Over all the broad domain of Ellerslie, that a few weeks ago owned him as master, tears are flowing freely from eyes unused to weep, for that they may never again look upon the kind and thoughtful face of one who had so long shared their sorrows and their joys, and to whom they ever looked for counsel, encouragement, sympathy and aid.

There, with the opening spring, no new-projected plan for bringing out fresh beauties in that glorious landscape will be developed; no new triumph of the florist's skill will grace the lawn to greet the month of roses; no new device to please, instruct and elevate the tastes of thousands upon thousands of children, youth and teachers that landed at his dock from year to year, and spread themselves by river, lake, and wood, and lawn, over all that fairy land, drinking in through every sense the purest enjoyment that wealth, and taste, and skill, know how to confer upon the young.

But within the mansion—within the doors of what has been the brightest and most peaceful of earthly homes, as it still is the loveliest and most beautiful that crowns the shores of the Hudson, we may not enter now; for mournful silence reigns within those walls, and those who in the past have made that home radiant with gladness, are bowed to-day in sadness over their dead, in a foreign land.

But those stricken ones are not as those who mourn without hope, for they know in whom they trust; and though the light and joy of Ellerslie have departed, they know their loved and honored one has entered a mansion fairer than his skilled taste could plan, and opened his eyes on scenes more enchanting than his imagination ever conceived.

Mr. Kelly's last appearance with this society was at our late Fair, near this city, in October last. Two days before, when it was somewhat doubtful whether he would be able to come, and in view of his failing strength he said to me, "When I can no longer work, it is my prayer that I may not long remain on earth;" and most signally that prayer was granted.

Although in a foreign land, yet surrounded by all his most cherished ones, without wasting sickness, calmly and peacefully he passed away, "and was not, for God took him."

At what period of his life our friend began to "walk with God," I never asked, but I think it must have been almost as soon as he began to walk with his fellow-men, for in all the years I knew him, he seemed ever to walk by His side as with a cherished friend.

Quietly, unostentatiously, reverently, he communed with the Divine Master, and inquired, "Lord, what wilt thou have me do?" To know the Master's will, was his study; to do it, his labor and delight; to go home when his work on earth was done, his reward.

Gentlemen of the Society, I know of no fairer model of a Christian gentleman—a country gentleman in the highest sense, than was William Kelly; and as such, I commend his life as an example worthy of imitation.

On those of us who constitute the Board of Ex-Presidents and counsellers of this society, whose heads, like his, are being silvered with the frosts of years, this blow falls heavily. Not only shall we miss this warm-hearted, courteous, high-toned gentleman of culture and of taste, from our councils, and from those delightful social gatherings, where met the purest and noblest representatives of our state; but other seats at our Board must soon be vacated—our own among the number.

May it be our Father's good pleasure, that when our work on earth is ended, we, too, may find our record on high, and "rest—sweet rest, in Heaven." Mr. President, I have the honor to submit the following resolutions:

Resolved, That with feeling far beyond official action, this society, in the midst of its annual meeting, seeks to express its sorrow for the loss which the New York State Agricultural Society and all that it cherishes have suffered in the death of the Honorable William Kelly, of Ellerslie.

Resolved, That we bear grateful witness to the value of his services in the society, to that bright page in our annals which marks his administration as its President, to the wisdom in council and energy in action which, as well before as since that period, made his name and presence to the society its implicit reliance under every circumstance of anxiety, or of prosperity, and from which official connection with our society, we could at all times turn to witness the realization of the very aim and object of our existence and labors, the prosperity of the farmer at his own home, sagaciously and superbly illustrated by him in his own fields, and where a refined hospitality made welcome so often those with whom he labored among us.

Resolved, That we are constrained by gratitude and duty to bear record that this distinguished citizen made for himself an honored name among men in every department of a useful life. As a statesman, he served his country with stainless honor, sound judgment and practical sagacity. As a merchant, he was enterprising, upright and successful. As a philanthropist, he was often a gratuitous administrator of laborious trusts for

the benefit of others; he was a munificent supporter and encourager of men of letters and an efficient promoter of literary culture, rendering unwearied and valuable service as a trustee of various important literary institutions, and especially of Cornell University, of the University of Rochester and of Vassar College. As a Christian he was an ornament to the Church, which he served with unswerving fidelity and with a generous hand. In life he made the world better by his virtues and his labors, and dying he has left a sweet savor behind him.

Resolved, That the New York State Agricultural Society make this record to-day in honor to his memory, feeling only too keenly that the words they utter are but feeble interpreters of the profound and universal grief.

Ex-President, the Hon. John Stanton Gould, in seconding the resolutions, spoke as follows:

Mr. President—I never felt before, so forcibly and so keenly, the inadequacy of my own vocabulary to express the emotions of my heart.

In common with all those who have known Mr. Kelly, I have loved him with a love that has very rarely been awarded to any other man.

This society is now sailing upon a prosperous tide, and those who have lately entered into its service are little aware of the anxieties and toils which its early founders were called upon to pass through. But those who know them, and remember them well, will have felt, as General Patrick has so eloquently expressed it, how admirable were the counsels of Mr. Kelly, how efficient were his labors, and how excellently they were adapted to the special exigencies that arose.

The members of this society have long been associated as a band of brothers, honoring, respecting and esteeming each other. But amongst us all, there is no one who has elicited so much love and reverence as that which has been accorded by us all, to our dear departed friend. His gentle courtesy, his sweet demeanor, his loving character, and his resolute earnestness of purpose, have left their deep impress upon us; and when we heard the sad tidings that he whom we loved had fallen in a foreign land, there was a wrench upon each one of our heartstrings which I have no language to describe.

He was indeed a jewel rare. He was not only conspicuous as an agriculturist, a merchant and a philanthropist, but he was so constructed that a beautiful harmony and coördination existed in all the elements of his character, that no part was unsymmetrically developed at the expense of any other. There was no danger that he would be seduced, by excitement or impulse, into undue extravagances of expression, or of action, or allow his predjuces or impulses to control the sober dictates of his judgment. All his faculties were so admirably coördinated that he brought forth the fruits of a beautiful, blameless and useful life, as few have ever done. Not only were his intellectual faculties thus coördinated, but what is still more rare, there was a co-relation between his intellectual, moral and religious faculties, such as I have rarely witnessed in my pilgrimage upon earth. His intellect cast a clear and steady light upon his faith, and his faith beautified and adorned his intellect.

General Patrick said he never knew the date when Mr. Kelly first began to serve the Lord. I know no date, but I can bear a cheerful and honest testimony that if "serving the Lord" is synonomous with endeavoring to learn his will and do it here upon earth, Mr. Kelly has served the Lord from the first moment of my acquaintance with him, which began more than a quarter of a century ago. He was not confined by any narrow and sectarian notions. "The whole earth was his country, and every man was his brother."

Not only was his philanthropy and charity manifested in large and splendid benefactions to literary and charitable institutions, which would be lauded in the newspapers, and spoken of admiringly in all social circles, but it descended to the lower walks of life, where it gladdened and comforted the homes of the despondent, the downtrodden and the poor.

Being a neighbor and a friend, I had an opportunity of seeing the daily beauty of his walk and the unobtrusive charities of his generous hand which others may not have enjoyed. I have been told by the teachers of the public schools that Mr. Kelly was in the frequent habit of visiting those schools, and examining them thoroughly and patiently in all their departments; if he found that there was any branch of study taught in them that was not receiving as much attention as it seemed to him that its importance demanded, he would give a five or a ten dollar gold piece to the teacher and say to him, let these children, from this time forth, practice penmanship (if that was the thing that was neglected)—let them try for three months to see who shall most excel, and who shall make the most rapid progress. When the three months were expired, he was always there to see the prize adjudged and duly paid. The benefit of this watchful care and pecuniary stimulus was most marked in the progress of the schools in his vicinity, and might be imitated with advantage in many other places.

When he found any child in those public schools that was really acquiring the elements of learning with zeal and earnestness, giving promise of a capacity for high intellectual attainments, he always aided such pupils as required it with his valuable counsel and with his liberal pecuniary assistance. But no one knew who was the benefactor, save him who was the recipient. The whole of his charity was thus done in secret and scores of young men and women who are now making a reputation for themselves, and acquiring fortune and honor in the world, owe the origin of their prosperity to the quiet benefactions of our dear departed friend.

Power and ability is given to only a chosen few thus to raise men up from a low estate to high positions in the earth, where they may shine as lights in the world, to bless and adorn our common humanity. I know but few who, in this quiet and unobtrusive way, have done so much as he did to make the world better for his existence in it.

I remember when he offered his resignation of the trusteeship of Cornell University, I wrote to him most earnestly to withdraw the resignation, for I knew full well the value of his services to the institution. He wrote me a letter in reply, which I shall never forget; he said that it was absolutely necessary for him to relinquish the more arduous portions of his life work, on account of his failing health. "I have loved to work, while the power of work was in me," he wrote, "but now the fire is going down, and soon the time must come when the night cometh when no man can work; I believe that I can be most easily spared from this sphere of duty, and therefore this must be among the first that I ought to relinquish. I do not do it because I desire to; it is not that I do not love the institution and its objects as well as ever I did, or that my confidence in its success has diminished, but my attention, such as I can still give, must be confined to business which I cannot at present relinquish. Here and there I have young men whom I have started in business, and I have been carrying it on for their sakes. They need my aid and counsel now, and I trust that when I am gone they too, each one as a centre, will extend those benefits to other enterprising and worthy young men which I have to them."

And what an example he gave us all in the beautiful home which he created at Ellerslie. My heart went with

General Patrick as he beautifully pictured the varied charms of that delightful place. I can place my mind upon farms in New York which are far more profitable, and which will yield a greater amount of crops to the acre, but I cannot recall any place in the State of New York or in the United States, which exhibits so much of real taste and perfect beauty. No one which is so obviously the outward expression of the inner sense of beauty in the heart of the designer as this.

Those who have seen the flowers so sweet and beautiful. the verdant lawns, the shady groves, and that magnificent collection of orchids which his exquisite taste had prompted him to collect from almost every region on the globe, and which was freely thrown open to the inspection of all who wished to see them, will readily admit that his Edenlike home at Ellerslie was as admirably adapted to diffuse an æsthetic taste amongst those who visited it, as it was a testimonial of the skill and judgment that created it.

I have no time to speak of the library, and of all the other treasures of his beautiful home. Nor of his generous and cordial reception of the children of Sabbath schools, and the inmates of orphan asylums, who never knew the consolation of a parent's home, that frequently made excursions to Ellerslie in the summer. But his kind attentions to these children were so cordial and paternal, that they left the most delightful impression upon their minds, and will be remembered as bright oases in their lives as long as memory lasts. The grace and beauty of the hospitality which he exercised at Ellerslie among his chosen friends will always abide in their memories; but I must draw a veil over these scenes, as too sacred for the public gaze.

Permit me, before I close, to allude to a single instance of his benefactions to the cause of literature.

It is well known to those who read the newspapers, that the president of Cornell University was exceedingly desirous of procuring a mathematical library which should surpass any that had been collected in any university in this country, and which should meet the wants of the most advanced students of the higher branches of mathematics. The library which he had in view as a nucleus was suddenly snatched from his grasp by a rival institution. Mr. Kelly spoke no words of sorrow or regret, but he contributed the necessary funds and made other arrangements, by which a drag net was swept through the whole of the mathematical collections of Europe and America, and everything which could be obtained for money was thus brought together, so that the mathematical library of Cornell is now—owing to his great kindness, and keen sense of what was required—almost as perfect as can be desired.

I desire to second the resolutions presented by Gen. Patrick, and I would suggest that the Secretary be directed to add another resolution, expressing the deep sympathy of this society with his family and friends for the irreparable loss they have sustained. We are told, Mr. President, that the path of the just is as a shining light that shineth brighter and brighter unto the perfect day May we ourselves, and our successors in the society, be incited to follow the path which has been illuminated by his example, so that we, like him, may leave the world better for our having lived in it—

> And, departing, leave behind us
> Footprints on the sands of time;
>
> Footprints, that perhaps another
> Sailing o'er life's solemn main,
> A forlorn and shipwrecked brother,
> Seeing, shall take heart again.

Ex-President, Hon. A. B. Conger, addressed the society as follows:

Whether it be wise, or seem an intrusion, after what has been so eloquently and fervently expressed by others, for me to say a word, I know not; yet, as my feelings prompt, I cannot withhold some humble tribute to join in with this spontaneous memorial of our sorrow.

I know—I am willing even to reiterate—what has just been said, that words are but poor messengers of this grief of ours. Though sometimes, under the influence of joyous emotion, they are said to be winged, and rise with the imagination or reason to their higher flights, yet, when sharp blasts of affliction come, like the birds o'ertaken in a storm, their pinions droop, they falter and sink, and are lost in inarticulate cries. What we see so frequently in private life, where the voice which would attempt to sketch the worth of the departed is drowned in lamentations we should here repeat, and unman ourselves were we to dwell upon the extent of the loss that we have met.

At best, all we can do now is to seek to draw, in some faint outline, the life and worth of our departed friend. Given, then, a life actuated by a divine impulse, and let it work itself out in numberless channels of usefulness; let it spend and be spent in works of beneficence; let it go on and close at last quietly, with gratitude to the Giver, and we have the life of Mr. Kelly.

Mr. President, I am not reluctant that my friends have dwelt, in this opening meeting of our society, upon the Christian virtues of the deceased We cannot deny—we cannot suppress the fact—we might as well openly avow it—that those choice spirits who have swayed the counsels and guided the course of this society have been animated by the Christian sentiment of doing good, and by little else, unless we confess the honest pride we have in the simplicity of its organization, its conservative and onward career.

I heard lately of an incident, in the life of Mr. Kelly, which touches, more tenderly than I knew before, the spring of that benevolence which was the controlling element of his character. On one occasion, a man whom he had frequently assisted, and who, from some strange freak of his nature, had returned the benefits received with marked and openly expressed ingratitude, came again to receive the aid he then needed; and when a young man, whom Mr. Kelly was doubtless nurturing in his school of beneficent action, ventured to remonstrate, the ready hand seized the pen and the cheque was written, and the interview was closed as these words were uttered: "Ah! if my Heavenly Father exacted from me these daily pence of gratitude where should I stand?" But here it behoves us to speak of Mr. Kelly as a farmer. Agriculture, for him, was, at the first, retirement from the busy whirl of city life. It soon became, and continued to be an inspiration of delight and his cherished pursuit. He was truly, and was not ashamed to be known as, a farmer. His steadfast aim was to illustrate the perfection of his art at Ellerslie, now, alas! for us, a desolation without that presence which made it a scene of thrift and beauty. His success at home had its parallel in his work abroad. What abiding interest was his in the doings and prosperity of of this society. What journeyings on missions to inspect farms throughout the state in high states of culture, and competing for our prizes; in constant attendance at our Board, our winter and autumnal gatherings! What wise counsel in deliberation; what urbane and cordial demeanor toward all! What earnest solicitude in agriculture, as a profession; what generous support to institutions founded for its instruction, and the knowledge of its researches! What—but all is well known to our farmers, and stands of record in our archives. This society has lost a dear and well-tried friend. Many of us would like, in the expression of our true regard, to say, that we have lost a brother. Most of the men of this society (for so few silvered heads remain) must say they have lost a father.

Mr. President, this alarm of death admonishes us all; it leaves this single lesson to those who must soon come prominently upon the stage We point them today to the life and example of Mr. Kelly, as the model which they may best take to make themselves fit successors to the grand responsibilities of this society. Then they may aim to do the work which he best initiated, and sustain this society in the high position it has and by which it commands the respect and admiration of the people of this state.

The resolutions were then adopted.

On motion of Ex-President Conger, it was

Resolved, That a committee, to consist of three members from each Judicial district, selected by the members present from the district, be appointed, for the purpose of nominating officers for the ensuing year; and also, if they see fit, to recommend the place for holding the Annual Fair.

The following members were thereupon constituted such committee:

First district—Thomas H. Faile, John D. Wing, Samuel Thorne.

Second district—A. B. Conger, George H. Brown, Benjamin L. Swan.

Third district—William Doyle, Adin Thayer, Jr., Minard Harder.

Fourth district—Isaac V. Baker, Jr., Berry Long, Chauncey Boughton.

Fifth district—James Geddes, Harris Lewis, O. B. Gridley.

Sixth district—John Banks, Wheeler H. Bristol, William Smythe.

Seventh district—D. D. S. Brown, A. S. Wood, W. M. White.

Eighth district—William Bristol, E. Holdridge, H. Bowen.

The committee then retired for deliberation; and upon returning, reported by their chairman, the Hon. Abraham B. Conger, the following nominations:

President—Milo Ingalsbe, of Washington.

Vice-Presidents.

1st district—John D. Wing, of New York.
2d district—Edwin Thorne, of Dutchess.
3d district—Daniel Doncaster. of Albany.
4th district—Frank D. Curtis, of Saratoga.
5th district—James Geddes, of Onondaga.
6th district—Alexander S. Diven, of Chemung.
7th district—Benjamin F. Angel, of Livingston.
8th district—William H. Pendry, of Orleans.

Corresponding Secretary—Thomas L. Harison, of St. Lawrence.

Recording Secretary—William H. Bogart, of Cayuga.

Treasurer—Luther H. Tucker, of Albany.

Executive Committee—Adin Thayer, Jr., of Rensselaer; Harris Lewis, of Herkimer; Robert J. Swan, of Seneca; Joseph Julland of Chenango; John L. Cole, of Wayne; James W. Wadsworth, of Livingston; Wheeler H. Bristol, of Tioga; William M. Holmes, of Washington.

And further reported, that they did not recommend any place for holding the Annual Fair.

Whereupon the report was accepted; and a ballot being had, the officers nominated by the committee were elected.

On motion, the society took a recess until 7:30 P. M.

The society again met at 7:30 P. M., in the same chamber, President Church presiding.

Asa Fitch, M. D., Entomologist of the society, made a summary report of his work during the year.

Ex-President Gould read a memorial, prepared by Ex-President Allen, of Colonel John Milton Sherwood, Ex-President of the society, as follows:

MEMORIAL OF EX-PRESIDENT SHERWOOD.

Colonel John Milton Sherwood, the fifth president of this Society, was born in the town of Norway in the county of Herkimer, New York, on the 16th of September 1793, and removed with his father, the late Isaac Sherwood in the year 1798 to a farm on military lot number eleven, in what was then the township of Aurelius in the county of Onondaga, but now the town of Sennett, in the county of Cayuga. He again removed with his father from the farm in Aurelius to the hamlet, now the village of Skaneateles, in the county of Onondaga, in which place the father established himself as a merchant in 1803. After receiving some rudimental instruction from private teachers, the son was sent by his father to be further educated at Dr. Alexander's classical academy at Fairfield, in his native county of Herkimer, in 1808; which institution, during his attendance there, was removed to Clinton, in the county of Oneida, and raised to its present dignity of Hamilton College. While he was at Hamilton his father became associated as a partner with Jason Parker, of Utica, and Thomas Powell, of Geneva, in the business of maintaining and running a tri-weekly line of four horse stage coaches between Utica and Canandaigua, and which, during the war 1812-15 was extended westward to Buffalo. After the return of John from Hamilton, he devoted himself to the mercantile, and also to the company business of his father, Parker and Powell, and soon thereafter was placed in charge of all that company's accounts. He also collected dues from the Government for transporting the mails and made the necessary disbursements along the line. Upon arriving at his majority he was admitted into the firm of Parker, Powell and Co., as a junior partner, who about that time added to the concern another stage line, called the "Fire Fly Telegraph," and increased the frequency of the trips. On the 27th October, 1818, he married Henrietta Betts, daughter of Frederick Betts, of Fairfield county, in the State of Connecticut by whom there were subsequently born to him five sons and four daughters, of whom three of the sons and one of the daughters survive, while the ashes of two of the sons and two of the daughters repose near those of their father and mother in the rural cemetery at Auburn. The same year with his marriage, he received a commission as Colonel of the N. Y. State Militia, from Governor De Witt Clinton, and was honoured with a position on his staff. From that time forward to the time of Governor Clinton's death in 1827, he was also honoured with the friendship of that distinguished statesman. In the year 1819 he removed with his wife to the village of Canandaigua, where he was better able than at Skaneateles to look after the stage business westward of that point. While he resided there another line of stage coaches called the "Pilot" was added to the concern.

In 1823 he was the successful bidder over all rivals for transporting the U. S. mail in a daily line of coaches between Albany and Buffalo, over the ridge road, so called, west of Rochester, and although he shared the business as before with his former partners, he became thenceforward the head of the firm, which was known as "J. M. Sherwood & Co.," the designation that appeared upon the coaches. The same year

he removed with his family to the then thriving village of Auburn, which he made the headquarters of the mail stage coach business as long as it lasted. From the date of his removal to Auburn, the passenger business increased very rapidly—so rapidly and greatly indeed, that before the stages were superseded by railroads, they filled and often overloaded each way from Auburn to the ends of the routes (counting the nights with the days) twelve and even fifteen swift moving coaches daily. All these facilities for travel were furnished by his company under his direction and superintendence, except what were furnished for a very brief period by the "Pioneer Line," so called, an opposition line of coaches that was maintained for a while by Andrew P. Tillman and his associates.

In the stage-coach business, which grew to be an immense affair, requiring and involving heavy investments of capital, employing a numerous army of agents, station keepers, purchasers of horses, coaches and supplies, clerks, mechanics, drivers, hostlers and laborers, and requiring the utmost promptitude, vigilance and activity, in order to keep the business moving, and and to satisfy the demands and caprices of an impatient and exacting public, Colonel Sherwood was equal to every emergency. His commanding energy in moving with regularity and order such a mass of human and animal machinery, was proverbial all along the line. He comprehended his duty to the public he served, and discharged it in the minutest, as well as the greatest particulars, with the utmost fidelity. His own pecuniary ability and that of the firm was sufficient for all his purposes, and his and their financial credit was equal to all emergencies. He was master of that great situation.

It is eminently due to the memory of Colonel Sherwood to say in this place that, when he was in his prime, he was a superior man in every business relation or capacity. His mind like his body was gigantic; and his views upon all general subjects, especially concerning improvements in transportation and husbandry, were comprehensive and clear. He thought, as he moved, with strength and independence; and by general consent he held a commanding position in every presence and every company.

After being fairly settled at Auburn, as he supposed for life, with a growing family around him, he engaged at once in various enterprises for the improvement of the place, conspicuous among which were projects for the erection of a church and hotel. Of these the Second Presbyterian Church in which he worshipped with his family, and the St. James Hotel in that city (then known as the American) are monuments. Of the church he was only one of its several munificent founders and patrons; but of the hotel he was, with his father, the principal proprietor. Both were projected in 1829 and completed in 1830. He was also one of the projectors and corporate members of the Auburn and Syracuse Railroad Company, incorporated in 1835, and of the Auburn and Rochester railroad, incorporated in 1836. As a member of their respective Boards of directors he displayed the same business qualities and characteristics he had so long exhibited in stage matters. Although he clearly enough forsaw, a long time before the railroad through the State from Albany to Buffalo was constructed, that its completion would supersede and break up his favorite and profitable occupation, he actually assisted in that consummation from a patriotic conviction that the interests of individuals must always, in a country like ours, give way before public requirements. His views of all such matters were broad and elevated.

When the stage business for which he was so well adapted, and in which he was so useful and popular, was actually superseded by railroads in 1841, he retired to a farm within the corporate limits of Auburn, and began the business of stock raising and arable agriculture. He purchased what was known as the "Garrow Farm," at first, but disliking it for his purposes, he purchased what was known as the "Steel Farm" adjoining it, and after erecting upon it a dwelling house and outbuildings, removed to it in 1844. As soon as he turned his attention to farming and stock raising (which was in 1841), he became the President of the Cayuga Co. Agricultural Society, and continued in that office until 1846, when he was elected to the office of President of the New York State Agricultural Society. After getting fairly under way in the business of stock breeding, he became quite as famous in that department as he had been theretofore in the stage business. He entered into it with determination and with heart. To no other man are the people of central New York so much indebted as to him for raising the standard of stock in that section, especially that of neat cattle, sheep and swine, from a low to a respectable condition. Obtaining, from the best and most accessible herds within his reach, cattle, sheep and swine of the most approved breeds of the day, he also imported several Short Horn bulls and cows of the celebrated Princess tribe, together with Southdown sheep from England, and bred them with decided skill and success; but the low estimate with which the agricultural public at that time regarded all *improved* animals failing to second his efforts, the *pecuniary* result failed in rewarding his praiseworthy enterprise with its just rewards. He bred good stock accurately, of every kind to which he devoted his attention, and at the present day many celebrated Short Horn animals (some of which at high prices are now sought to be exported to England) trace their pedigrees back into the herd of Colonel Sherwood. He was also an excellent farmer. He well understood soils, their necessities of drainage and thorough culture, and the proper crops adapted to them in their various productions. He bought a worn-out farm, exhausted by careless tillage, and restored it to fertility and abundance in its annual yields of grain and forage. He laid out and planted a beautiful park in front of and around his dwelling, now one of the finest in the vicinity of Auburn, and in this displayed the true spirit of home embellishment. He was a capital judge of horses, and in his staging life they were "the best on the road," as travellers said, while on his home farm they were choice in blood and fleet in action. It was a cheering sight to look at the portly form of Colonel Sherwood when riding out in his comfortable carriage, reins in hand and speeding forward a noble pair of roadsters. He loved his horses with almost a fellow feeling.

In 1852 Colonel Sherwood met with a heavy affliction in the loss of his superior and very excellent wife. She was the central light in his household, and to an unusual extent in his case, his comfort and consolation. If his partialities for any person or object upon which he set his heart were strong (and the necessities of his nature would not allow them to be otherwise), his affection for and attachment to his noble wife were stronger. So that notwithstanding all his accustomed fortitude and philosophy in ordinary cases of domestic

bereavement, and all the efforts of his surviving children and friends to console and cheer him, his mind was so deeply saddened by her death that he never fully recovered from the shock. Not only his dwelling, but the farm with all its embellishments and surroundings, appeared to him a desolation without her. From the date of that event forward, his interest and profits in farming and stock raising, as well as his general health and vigor gradually declined. He was compelled to give up the business altogether in 1856.

He married another very estimable lady in 1855. remained in Auburn during the war, in which he rendered public services as a commissioner for raising troops, after which he removed to Ontario county, where he remained several years, and thence to Syracuse, where under the weight and increasing infirmities of seventy-eight years he died, greatly respected and honored by all who knew him, on the 16th of May 1871. On the 18th of the same month, in the presence of a large concourse of relatives, former neighbors and friends, his remains were deposited with appropriate services beside the ashes of his previously departed wife and children, in Fort Hill Cemetery of the city of Auburn.

In summing up the personal character of Colonel Sherwood, he was not only a man of large and noble stature, but a man of large heart and truly noble nature. In his liberal and well-appointed home he indulged in a wide and welcome hospitality, not only to his own cherished friends, but to all who entered beneath his roof, and his estimable wife in the commendable features of domestic life was fully his equal. Many have been the hours and days and nights which the writer of this memoir has enjoyed in the pleasure and tranquillity of the charming home of the Sherwoods at their outskirt farm at Auburn. Their table was wide-spread and abundant; their social intercourse refined and intelligent; their courtesies the kindest; while kindly benevolence and deep religious sentiment overshadowed and hallowed them all.

As a citizen of the community among which he dwelt, Colonel Sherwood was ever active in promoting its charities as well as its enterprises. Although wronged in some of the adventures in which he had embarked a portion of his means for the public welfare, his faith never flagged in the beneficence of their results. His heart was ever alive to the elevation of his fellow men in moral, religious, and political affairs. He was a friend to education, to public schools and libraries, and to whatever was promotive of public good; and he hated all shams and pretensions. Although modest in expression, he was outspoken in his sentiments, decided in his opinions, steadfast in his convictions. Of the Presbyterian faith in theology, he was a humble and sincere follower of its teaching, doing good to all men, in accordance with his ability; he was in short, *a Christian gentleman*—and no one could ever upbraid him with overreaching or dishonesty in the course of his wide-spread and multifarious transactions.

As President of the State Agricultural Society, he discharged his duties with a conscientious fidelity which aided largely in elevating it to the position it has since attained. He shirked neither personal labors nor sacrifices which its interests demanded, and has left upon its roll of presiding officers an honored name. After his retirement from its offices and honors, his heart was ever with its welfare, even to his latest years. his greatest regret being that his increasing infirmities would not permit him to take a more active part in the promotion of its interests. Taking him, all in all, John Milton Sherwood was a benefactor to the Agricultural interests of his State and Country, and as such his memory will ever be cherished.

Ex-Presidents Faxton and Geddes followed with remarks, illustrative of the public career and character of Colonel Sherwood.

The President then addressed the society as follows:

President's Address.

Fellow Members of the New York State Agricultural Society:

More accustomed to the farm than the forum, I feel that the plough in my hands is a more familiar instrument than the pen. I invoke then your lenient criticism, on this occasion, towards one who was born and has lived his whole secluded life on the same farm, which in my earlier years, was buried deep in the wilderness on the banks of the then remote Genesee, but which like most parts of our common country, has of late been linked to civilization by the rail and the telegraph, and thus vivified into verdure and beauty and productiveness. This history will probably apply to the estates of most of my auditors, and you will thence the more readily follow me in the reflections and deductions to be derived from practical experience amid such shifting scenes and rapid developments.

In the earlier epoch of our national life, acres were cheap and abundant, labor scarce, markets distant, uncertain, and frequently so remote as to preclude the sale of surplus products. At that primitive period, agriculture (if it could be so termed) was confined simply to obtaining supplies for the home necessities of the farmer and his family, at the cost of as little labor and outlay as practicable. There was then no stimulant to the study of agriculture, as there was little or no inducement.

In the second epoch of our progress, when markets began to be accessible. and when an increased activity in the arts and manufactures began to stimulate the growth of towns and cities, creating demands for more varied products, even then a great stumbling-block stood in the way of the successful practice and progress of economic agriculture. This obstacle, strange as it may seem, was the excessive fertility of the soil that had been at rest and recuperating for past centuries. For a while the farmer labored under the error that this fertility was almost inexhaustible, and he made inordinate demands upon the soil and begrudged the return of even the smallest pittance.

Time and experience, however, soon cured that error, and much more rational efforts have been inaugurated to secure and perpetuate profitable agriculture. In witness of which I would cite the saving and application of manures and fertilizers; the organization of societies; the wonderful improvement in implements and labor-saving machines, and of the breeds and breeding of stock; the patronage given to agricultural books and periodicals; the ability with which many are edited; the valuable contributions from practical farmers; all indicating that the intellect more and more controls and directs the muscular effort.

We have made great progress, but have not yet reached the goal; our course may still be onward; more minute attention to details, and closer study on the part of each farmer of the relations and capabilities of his own farm, and how they may be best turned to account, should keep pace with the constantly enhancing values of lands, that the productiveness and profits may be increased at least in the same ratio.

In the brief space allotted to an address on an occasion like the present, I must confine myself to a few general outlines and aim only at making suggestions that may induce each individual to investigate such of the topics in detail as may most affect his peculiar interests.

Among others the study and practice of what may be termed *adaptation*, is of importance, as applied to soil, climate and locality, as well as to the selection of the crops to be planted, the animals to be reared, the manures to be prepared, the buildings to be erected; in fine, to every department of agriculture and rural life. Neglect of this subject often leads to disappointment, and even brings into contempt the efforts of this Society to advance the agricultural interests of the State.

A farmer reads in your "Transactions" of a successful experiment in the production of some crop from which a large profit is realized; stimulated by the expectation of like results, he devotes his whole available land to this crop without any consideration as to the relative conditions affecting his experiment, and the successful one described. He is disappointed in his results, and at once discredits the statements of the publication, pronounces agricultural societies all humbug. Another is delighted with a fine exhibition of Short Horns, invests largely in their purchase, and with high anticipations, puts them upon his scanty hillside pasture, winters and cares for them in the same negligent manner that he has treated the hardy stock hitherto reared. These fine but less hardy cattle soon deteriorate under such treatment, and Short Horns are at once pronounced a failure. Another reads of experiments with certain manures, from the use of which a most gratifying return in crops is reported, without reference to the kind of soil on which the experiment was made; a like experiment is tried, and the result proves unfavorable. The statement is then discredited and the manures condemned. Want of attention to the question of adaptation in this way greatly lessens the usefulness of this and kindred societies. While the solution of this question is sometimes so palpable as scarcely to admit of mistake, it often requires the most careful observation.

No one would think of sowing salt upon meadows moistened by the tides, but other fields may be benefited by the application of salt; it may be, it is true, a nice question to determine when and where to apply it.

No one would think of planting the gourd seed corn in Canada, but just how far north it is desirable to plant, it requires intelligent experience to determine; so with rice, sugar, or cotton, though these are not grown in our state they serve for illustrations; and there are many questions as to products affected by climate within the state quite as difficult of solution, as it is to decide where the cotton crop should be arrested by climate. Nor are these questions to be determined by parallels of latitude alone; the character of soil, the altitude, the influence of water, and other less obvious causes enter largely into their solution. The corn crop may ripen in a very short season on a well manured sand or gravel soil, while in the immediate vicinity on a clay or moist soil, it may require a much longer time.

On the banks of the Crooked and some other of our lakes, the Catawba grape seldom fails to ripen in perfection, while a few miles from these lakes in every direction, and for more than a hundred miles south, this grape seldom matures.

I might enlarge upon this subject as it refers to climate, by considering how far climatic difficulties may be overcome. We know that many products under proper treatment adapt themselves to the climate, and by observing the proper time to plant, the proper soil and seed, we may successfully cultivate in our climate many crops that once held no place among our products, such as tobacco, sweet potatoes, and many others.

But, adapting crops to climate is a much less difficult question than their adaptation to soils, to modes of cultivation and natures of manures. What lands had better be devoted mainly to grazing, and if to grazing, whether to rearing and fattening cattle, or to dairy, or to sheep, are nice questions to determine; and if grain growing is more suited to the soil, the kind of grain.

Perhaps no subject requires more intelligent study than the application of manures to soils. In this the experience of one man appears to be the exact opposite of another's; and we become confused in reading different experiments that yet may be reconciled by careful investigation. Results are often diverse when conditions appear similar. An experiment is given on a dry gravelly soil, and result stated. Some one has a field apparently similar, on which he conducts the same experiment with quite different results. Were all gravel of the same material, this difference might be inexplicable; but there is a wide difference between gravel formed from limestone and that formed from quartz; so with that formed from granite, slate, sandstone or other rocks. The same of loamy, sandy and clay soils, which are but the disintegration or decomposition of rocks, mingled more or less with vegetable matter, and often so nearly resembling each other in appearance, that nothing but analysis or experiments will detect the difference.

Much of the success of English husbandry is due to the application of this rule of adaptation. The English breeder suits his stock to the pastures on which they graze; hence the Short Horns are found in one district, the Devons in another, the Herefords, Ayrshires and Jerseys each in their own; and by this system of breeding for locality, and by careful selection, there has been a constant improvement in each variety. Their application of the same rule to cultivating crops and applying manures, has led to an increasing yield; while with us, from failure to study and apply this principle of adaptation in most cases, the best breeds of cattle actually deteriorate, and from the same cause the yield per acre of crops is growing gradually less, instead of increasing.

It is a safe rule to govern the farmer when he finds any crop failing in productiveness, after proper experiments by manures and cultivation, to conclude that that crop is not adapted to his soil. In like manner if any breed of cattle or sheep with proper care and feeding, and proper selection in breeding, is found to deteriorate even in the smallest degree, it is safe to conclude that the breed is not adapted to the locality. On the other hand when a farmer is constantly increasing the yield and quality of his crop, and consequently the productiveness of his farm, and when the animals reared are improving, it is safe for him to conclude that he is right in the selection of his crops, and in the breeds of his animals, and he should be very cautious how he is lured from this progressive course by descriptions or inspections of more profitable crops, or more admired breeds, in other localities.

This principle applies to grasses, fruits, vegetables, and all the productions of the soil, as well as to fences, buildings and improvements. What shocking abuse of architectural taste do we everywhere meet in farmhouses and buildings; some showy expenditure, ridicu-

lously out of place, having no reference to convenience or comfort.

How very much might the whole aspect of the country be changed by a little attention to architectural rules in farm buildings, from the dwelling house to the pig sty, with no increase of expense, and how much might the work of housekeeping be lightened by careful attention to the arrangement of houses, while the labor in caring for stock and waste of fodder may be greatly lessened by proper arrangement of buildings.

There is another subject of much importance to which I desire to direct the attention of farmers. It is one that has been often discussed, though with but little effect. I allude to the cultivation of too many acres for the labor employed.

There are two causes operating against reform in this respect: There is the ambition to own broad acres, and there is the temptation to invest in lands with reference to their increasing value.

Now, I propose to treat this subject without interfering with either of these motives. It is ennobling to the agriculturist to own broad acres, and I know in a country where, as in this, real estate is constantly increasing in value, more money is often made from the enhanced value of land than from its cultivation. I say to the farmers, therefore, buy and hold all the land your circumstances will allow, but cultivate no more than you can cultivate thoroughly.

I verily believe that, if all the labor that is bestowed upon all the acres cultivated in this state were bestowed upon one-half of such acres, the produce of the state would be greater than now. Cultivate the best of your land thoroughly, and let the remainder grow orchards and forests. It will increase in value in that shape more than under negligent culture, and imagine how much would be added to the beauty of the country if one-half the bald and poorly cultivated fields were converted into beautiful forests. And if meteorologists are right about the effect of forests upon drought, moisture, cold and heat, how much may be gained in this respect by clothing the land with trees.

The attention of the Society has often been called to the subject of permanent fair grounds.

The large expenditure annually incurred for temporary erections, the slight and imperfect character of these structures, and the dissatisfaction often created in localities that have incurred these expenses, furnish strong arguments in favor of permanency.

I recommend the selection of three farms, distributed so as to best accommodate the different sections of the State, on each of which suitable buildings should be erected, each farm placed under a competent manager and used for agricultural experiments and for rearing improved breeds of animals under the control of the Society. They may be made self-sustaining. The difficulty is to provide the funds to purchase the farms and erect the buildings.

In view of the importance of agriculture to the prosperity of the state, and of the fact that nearly all the taxes are collected from real estate, thus imposing upon farmers more than a just proportion of the burthen, I think we might fairly ask an appropriation from the State to make the necessary purchases and erect the buildings. If these views meet your approbation, I suggest the appointment of a committee to present the claims of the society to the Legislature.

I will briefly allude to another subject, one that is becoming of vital intesest to farmers. I refer to bonding towns under the general law of the state, for the purpose of aiding the construction of railroads.

This general law was not enacted until the greater portion of the State was reasonably accommodated with railroad facilities. The New York Central, the Hudson River, the New York and Erie, and a large number of other important roads were constructed in the absence of such aid, thus showing that when the amount of business to be transacted was such as to make it probable that capital so invested would receive a fair return, there was no difficulty in procuring its investment in these enterprises. But, when some village desires a side road, connecting it with one of the principal thoroughfares, no such inducement is presented to capitalists. In such cases it is reasonably certain that the money invested in the construction of the road will be lost by those furnishing it. This is a matter of indifference to designing villagers. The merchants, lawyers and others residing there, believing that they will add to their profits by an increase of business created by railroad communication, become very public spirited, so much so, that they are entirely willing to mortgage every farm in the town, to procure the means of constructing the contemplated road. They endeavor to convince the farmers that the construction of the road will greatly advance their interests, and thus induce enough to unite with the inhabitants of the village to bond the towns. In this way all the farms of the town are frequently incumbered and subject to very onerous taxation against the wishes of a decided majority of the property interests.

It thus happens that the bonding act operates with peculiar harshness upon farmers. While a village may be greatly benefited, the farmer will rarely derive any advantage from the contemplated improvement. The price of his products will be governed by the New York markets, and all the benefit he will derive in this respect will be the reduction, if any, in the cost of transport.

While farmers are anxious for the improvement and development of the country, by the increase of the facilities of intercommunication, they should retain in their own hands, each for himself, the right of mortgaging their farms for this purpose. Let others incumber their own property for any purpose to any extent they please, but let the farmer retain in his own hands the title in fee to his farm, giving him the right to cultivate it for himself and family, instead of the poor privilege of doing so for the benefit of bondholders in cities and villages.

The act in question has been upon the statute books only a few years, and yet a large portion of the towns are already bonded. Let it continue there, and the class of independent farmers owning their farms unincumbered, will soon be known no more. All will be reduced to the condition of tenants cultivating their farms for the benefit of bondholders, it making no difference to them whether paying the collectors in the name of taxes or landlords in the name of rent. Let all the farmers unite for the repeal of this most unjust act, practically introducing communism by subjecting the property of each to the will of the majority in hazardous business enterprises, and the object can be obtained before another meeting of our Society.

The impulse given to reform during the past year, should awaken sincere rejoicing.

May the good work go on, till lofty principle, integrity and honesty shall once more and forever control our legislation; till impartial justice, uprightness and sound judgment shall return to and purify our polluted halls of justice; till the purity of the ballot shall be again recognized as the palladium of our liberties, and guarded with unceasing vigilance; till finally the infec-

tion, that has to a degree tainted the very atmosphere we breathe, shall be removed. and we can all feel that the foundations of our national greatness still remain; and that we may yet erect thereon a superstructure that will endure and receive the admiration and homage of mankind through ages to come.

This completes the fortieth year of our organization as a society. Among many subjects of congratulation, there is here and there a shadow thrown across our path.

The death, but a brief month since, of one who has devoted so much of his time and attention to the interests of this Society, our most highly esteemed ex-President, the Honorable William Kelly, deserves more than a passing notice; to him we owe as much, perhaps, as to any one individual, the permanency and success of our association, the resolutions and remarks made here to-day, have so fully expressed the feelings of the Society, that I forbear to dwell further, much as I feel inclined to do so.

It is also fitting that we should allude to the decease of our venerable ex-President, John M. Sherwood, and to that of an ex-member of our executive committee, Craig W. Wadsworth; also to that of the Vice-President for the Sixth Judicial District, William M. Ely. The memory of these officers will long be cherished.

The balance on hand at commencement of present year, was $20,152.64; and since the receipts of the year, as shown by the Treasurer's report, are $9,172.40 in excess of the expenditures, we are able to carry forward at this date to the account of the new year, a balance of $29.325 04, of which about $15,000 is invested in United States securities, and about $12,000 deposited at interest with the United States Trust Company of New York.

The unusual prosperity of the present year, is to be largely attributed to the well digested plans and good management of our efficient Secretary.

To such other officers of the Society as have taken an active part, and coöperated to promote the welfare of the Society, I tender my grateful acknowledgments.

Although the season closes with diminished productiveness and reduced prices, we may still return grateful acknowledgments to a bountiful Providence, for a fair measure of prosperity, and for the peace that protects our hearth-stones, and the other blessings that encompass us.

Permit me, in the discharge of my last official duty, to present to you my successor, Milo Ingalsbe, of Washington.

President Ingalsbe thereupon, in taking the chair, briefly expressed his sense of the honor conferred upon him, and promised the best efforts of his energies and judgment to the service of the Society.

On motion of Mr. Gould, the thanks of the society were voted to Ex-President Church for his able discharge of the duties of his office, and for his address, and the same was ordered published in the Transactions.

Mr. O. B. Gridley, of Oneida, moved the amendment of the constitution, under the notice given by him at the last Annual Meeting, so as to provide that the Annual Meeting be held upon the Wednesday after the second Tuesday in January, instead of on the second Wednesday of February, as now provided. And, after debate, the question being put, the motion was lost.

The society then adjourned, to meet at the Agricultural Rooms at 10:30 A. M. next morning.

THURSDAY, *February* 15.—The society reassembled in the Lecture room, at the Agricultural Hall, at 10:30 A. M. The President in the chair.

Mr. Henry Bergh addressed the society in relation to the Society for the Prevention of Cruelty to Animals, and the legislation now proposed to extend its powers and usefulness.

Whereupon, on motion, the Executive Committee was requested to examine the bill proposed by Mr. Bergh, and to express an opinion thereon.

Mr. A. S. Fuller, of New York, then read a paper on Forestry, and the supply of timber; which was followed by a brief discussion.

The society then took a recess until 1:30 P. M.

At 1:30 P. M. the society reassembled; the President in the chair.

On motion of Ex-President, the Hon. George Geddes, the vote taken last evening upon the amendment to the constitution, proposed by Mr Gridley of Oneida, was reconsidered.

On motion of Mr. Geddes, the motion of Mr. Gridley was then amended, so that the proposed amendment should read as follows:

Resolved, That section 4 of the constitution be and is hereby amended, by striking out the words "second Wednesday in February," in the second line of said section, and inserting in their stead the words. "Wednesday after the third Tuesday in January."

The amendment being then put, it was unanimously adopted.

On motion of Mr. Ex-President Conger, Mr. Joseph Harris, of Monroe, was requested to present, at one of the evening meetings during the next fair, the paper upon the characteristics of the various breeds of pigs. prepared by him to be read at this meeting and postponed for want of time.

On motion of the same Ex-President, the society then adjourned.

EXECUTIVE MEETING, NEW BOARD.

February 15.—Present, the President; Vice-Presidents Wing, Thorne, Geddes, Diven and Angel; the Secretaries; the Treasurer; Messrs. Lewis, Thayer. Juliand, Cole, Wadsworth, Bristol and Holmes, of the Executive Committee, and Ex-Presidents Church, Hungerford, Faile, Patrick, Gould, Conger, Geddes, Faxton, Cheever and Prentice.

On motion of Vice-President Wing, it was

Resolved, That the Corresponding Secretary be designated as the acting Secretary of the society, with the same salary and allowance for clerk as last year; and that the salary of the Treasurer be the same as last year.

The Museum Committee reported that Dr. Fitch had rendered a report of his work for the year, and that the same was in type for publication in the Transactions of 1870; and that he had also completed, with some few deficiencies to be supplied this spring, the collection of insects required by the terms of his contract with the society. And it was thereupon

Ordered, That the Treasurer pay to Dr. Asa Fitch his salary, as entomologist, for the quarter ending January 1, 1872, and also the next quarter's salary when due.

On motion, the following members were constituted the committee on permanent grounds and buildings, in place of the committee appointed at the meeting on the 20th of December, 1871: The President, Vice-Presidents Wing and Geddes, the Secretary, and Ex-Presidents Faile and Church.

On motion, it was

Ordered, That committees, each of three members with power to add to their number, be appointed for the central, western, northern and southern portions of the state, to ascertain the feelings of the people in their respective districts upon the subject and practicability of obtaining permanent locations in the same; such

committees to serve as auxiliary committees to the committee on permanent locations, and to report thereto.

And the following members were appointed as such committees, viz.:

Central—Ex-President Campbell, Vice-President Geddes and Mr. Lewis.

Western—Vice-President Angel, Mr. Wadsworth and Col. H. Bowen.

Northern—Ex-President Hungerford, Mr. Thomas V. Maxon and the Corresponding Secretary.

Southern—Vice-President Diven, Mr. Bristol and General E. F. Jones.

On motion of Ex-President Faile, it was

Resolved, That it has now became the policy of the society, and an absolute necessity to the continuance of its annual fairs, to obtain, as soon as possible, one or more permanent fair grounds and buildings, and that the committee on permanent location be authorized to propose to the people of any city in the state that the society will hold its fairs at such city at least once in three years, for twelve years, if they will give the society the ground and a satisfactory sum towards permanent buildings thereon.

On motion of Vice-President Geddes, Col. Hezekiah Bowen, of Medina, was appointed General Superindent.

On motion of Ex-President Conger.

Resolved, That this society heartily approve of the objects proposed by the American society for the prevention of cruelty to animals, and recommend that such further powers may be granted to it by the Legislature of the state as may be found necessary to effect the humane purposes for which that society was instituted. Adjourned.

PREMIUMS FOR FIELD CROPS.

MANGOLDS.

John J. Lewis, Frankfort, Herkimer county, exhibited a sample of a crop of mangold wurzel, grown upon one acre of land. Yield 900 bushels per acre; premium $20.

STATEMENT OF CULTIVATION.

1. The previous crop grown on the land was mangolds, turnips and cabbage

2. Manured with twenty loads of barn manure.

3. Soil, clay loam, in good condition.

4. Farm located in the town of Schuyler, Herkimer county, on the north side of the Mohawk river, and having a southern inclination of about three degrees.

5. The land was manured with cow (barn) manure at the rate of twenty loads per acre. Land ploughed previous fall, and the manure applied in winter, left in small heaps; spread in spring, and harrowed in; land then ridged; seed sown on ridges at the rate of four pounds of seed per acre; sown the 8th and 9th of May. Crop harvested on the 21st and 23d of October, by John G. Lewis and William Wilcox, and weighed on hay scales. Weight of crop on the one acre measured, 54,000 pounds, or 900 bushels, at 60 pounds per bushel; and that there was nearly one and one-quarter acres in the whole field; and that the entire weight of the crop was 64,800 pounds, or 1,080 bushels, at 60 pounds per bushel.

The crop was cultivated in the ordinary manner with horse and cultivator.

The cost of cultivating the crop was as follows, viz.:

Ploughing in the fall	$4 00
Drawing manure	5 25
Spreading and harrowing manure in	4 50
Ridging land	3 25
Cost of seed and sowing	4 00
Cultivating and bunching	5 50
Cultivating and singling plants	7 50
Cultivating and hoeing	6 50
Cultivating and hoeing	$6 00
Weeding, or pulling out the weeds	4 00
Gathering crop	8 00
Total cost of cultivating the whole field	$58 50

Or a fraction over five cents and four mills per bushel. If the crop is charged with the interest on the money invested in the land on which the crop grew, and a fair proportion for the manure used, the mangolds cost seven cents and four mills per bushel.

JOHN G. LEWIS.

PEAS.

L. L. French, Richfield Springs, Otsego county, exhibited a sample of a crop of peas, of 35¾ bushels, grown upon 93-100 of an acre of land. Special premium $5 (being less than one acre).

STATEMENT OF CULTIVATION.

There are about forty bearing apple trees on the ground on which I raised this crop of peas last season. The crop preceding was potatoes, sweet corn and peas. The ground was ploughed in the autumn, and covered with green stable manure in the spring and harrowed, after which the peas were sowed and ploughed in about six inches. I think I sowed about one and three-quarter bushels of seed. Not thinking of competing for a premium, I began using the peas as soon as they were fit to eat, and continued till they became old, without keeping any account of the amount, but suppose if I had not used any, the crop would have been 37 bushels.

L. L. FRENCH.

Affidavits and survey as required by the regulations.

EXPERIMENT WITH WHEAT.

William P. Ottley, Phelps, Ontario county, exhibited samples of white and red Mediterranean, Treadwell, Wick's, Diehl, bald Amber and Lancaster wheats, and submitted the following statement of the result of an experiment in their cultivation. Premium, Silver plate $30.

In premium list of 1870, page 18, our Society offers a premium for approved reports, founded on actual experiment, on the comparative earliness, productiveness and profits of the different varieties of wheat generally sown; samples of each variety to be exhibited at the winter meeting of 1872, etc. I herewith produce samples.

Having resolved to make the experiment, in the summer of 1870, I prepared a part of a field for the purpose. The field was one sown with barley after corn, designed to sow with wheat in the fall. The field was ploughed during the month of August, eight inches deep, and top-dressed with barn-yard manure at the rate of twelve loads to the acre on the furrow. Harrowed and cultivated well; I drilled seven varieties, one-fourth acre each, on the tenth day of September, at the rate of two bushels per acre.

My plots were as near alike as practicable, two rods wide by twenty long. I left a small space between each variety for convenience in harvesting. The varieties were red Mediterranean, Treadwell, white Mediterranean, Wick's, bald Amber, Lancaster and Diehl. All of the varieties came up well.

Their appearance during the autumn was as follows, viz: The red Mediterranean was inclined to grow tall (as is peculiar to the variety) and had dark green leaves of medium width. The Treadwell was of medium height, the leaves wide and of a dark green color. The white Mediterranean was tall, and had dark green, rather narrow leaves. The Wick's was of medium height, with dark green medium sized leaves. The bald Amber was of a medium length, and had fine, light green leaves. The Lancaster was of medium height with fine dark green leaves. The Diehl had light green, short, wide leaves and stooled well. In the Spring of 1871 the red

Mediterranean, Lancaster and Diehl looked remarkably well; the Treadwell, white Mediterranean, Wick's and bald Amber loooked very well.

All of the varieties grew as well as could be expected during the Summer of 1871, it being a very dry season.

COMMENCED TO HEAD.

Red Mediterranean, May 27; Wick's, May 29; bald Amber, May 30; white Mediterranean, May 30; Lancaster, May 30; Diehl, June 1; Treadwell, June 1.

IN FULL HEAD AND BLOW.

Red Mediterranean, June 1; Wick's, June 3; white Mediterranean, June 3; bald Amber, June 5; Lancaster, June 5; Diehl, June 5; Treadwell, June 7.

DESCRIPTION OF THE SEVERAL VARIETIES.

The red Mediterranean is a red, bearded wheat and one of our oldest varieties. It has been in our town about twenty years, and has improved very much during that time. On good soil it produces well and grows to a good height and is inclined to lodge. It is a hardy variety and endures winter well. In times of the midge it was the only variety that was worth raising. It matures early, the chaff is very hard, which is one of the reasons of it being less injured by the midge. It also ripens naturally, and is less affected by storm than most varieties.

The Treadwell is a white wheat, half bearded half bald, being peculiar in that respect. It is a new variety, having been among us about five years. It grows rather tall, with a stiff straw, and is not inclined to lodge. It is among our latest varieties, and in good seasons produces well; but usually is driven to maturity, which causes it to shrink,

The white Mediterranean is a red, bearded wheat It is a variety that has been in this locality but a few years. Is a hardy wheat and usually produces well, somewhat inclined to lodge.

The Wick's is a white, bearded wheat that has been in this locality only a few years, usually produces well; is not inclined to lodge; matures well in a good season, and is among the best of white wheats usually grown.

The bald Amber is a red, bald wheat, and a new variety in this locality; it has been grown in adjoining counties for several years with good results. It is not inclined to lodge; gives a good growth of straw, and is sought for by millers, being pure amber.

The Lancaster is a red, bearded wheat that has been grown in this locality several years with good results. It is inclined to lodge; gives a large growth of straw, and usually a good sample of grain.

The Diehl is a white, bald wheat that has been grown in this locality several years, but not generally; it requires a choice situation in order to produce well. It is not inclined to lodge; straw short and stiff, the head is also short and close. In a favored locality it produces well; the grain is fine and plump, and closely resembling the old white Soule's wheat. In seasons of the Hessian fly it is affected more than most other varieties. It is easily cracked or broken, and requires the best of care in threshing.

The red Mediterranean was harvested on the 10th day of July. The Treadwell, white Mediterranean, Wick's, bald Amber, Lancaster and Diehl, on the 14th day of July.

TIME OF MATURING, PRODUCTIVENESS, PROFIT, ETC.

As all the varieties were sown on the 10th day of September, from 258 to 262 days elapsed before beginning to head. From beginning to head to blow, from four to seven days; from blow to full formation of berry, from fifteen to twenty days; from formation of berry to harvest, 25 to 30 days, making in all up to harvest about 300 days.

The above applies in this case to time and locality; but we all are aware that each locality varies according to circumstances. In regard to productiveness and profit of each variety, taking my table of weights and measures below, it shows the white Mediterranean gave ten bushels and one pound on the quarter acre. The Treadwell nine bushels and 26 pounds, and so on as they show.

I cannot take it as a settled point, but having regard to my past experience of 30 years with wheat raising, this experiment clearly decides at present in favour, for profit and productiveness, taking all into consideration, of the Wick's for a white wheat; and the red Mediterranean for a red wheat. But as I have said before, locality varies so much that others may succeed with other varieties. That I can only leave with the readers of the above to decide for themselves. Practical experience is worth all other. For twenty years past it has been all-important to sow early varieties of wheat on account of the midge and change of the seasons. The later varieties during that time have been much more affected, and in some cases reduced to worthlessness; many times reduced to five to ten bushels per acre, when at the same time the early varieties would yield fifteen to twenty per acre. For ten years past the midge has nearly passed away. We are now trying many kinds. Our desire is to grow a white wheat as formerly, as they are the most desired in market. So far our white varieties rank among the late kinds. I have for a long time desired to try seed from the far North, in hopes of its being better adapted to our climate, as it is evident that our seasons are shortening from time to time and call for early and quick-maturing varieties. Our old varieties, years ago, were the redchaff Bald, white Flint, Crate, Beaverdam, Soule's, and a host of others. The Soule's was the very best white wheat I ever grew. I once tried sixteen varieties in one year with no good result; it being in time of the midge. They were from England, France and Germany.

Threshed, weighed and measured varieties in experiment: July 21, threshed all kinds. July 27, weighed and measured all kinds.

VARIETY.	Yield of each plot.			Yield per acre.		Weight of measured bushel.
	lbs.	bu.	lbs.	bu.	lbs.	lbs.
Treadwell.............	566=	9	26	37	44	62½
Wick's	510=	8	30	34	00	62
Diehl..............	445=	7	25	29	40	61
Red Mediterranean......	535=	8	55	35	40	62¼
Bald Amber.........	506=	8	26	33	44	62
White Mediterranean...	601=	10	01	40	04	62
Lancaster............	504=	8	24	33	30	62

W. P. OTTLEY.

The other awards will be published in next Journal.

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THE JOURNAL

OF

The New-York State Agricultural Society.

VOL. XXII.] ALBANY, MARCH AND APRIL, 1872. [NOS. 3 & 4.

State Agricultural Rooms.

The Office of the Society is in the New Agricultural Hall corner of State and Lodge streets, Albany.

ANNUAL MEETING.

Pursuant to amendment of the constitution adopted at the Annual Meeting of 1872, the Annual Meeting will hereafter be held on the Wednesday succeeding the Third Tuesday of January in each year, at the City of Albany.

Annual Meeting of 1873, January 22d.

VOLUMES OF TRANSACTIONS WANTED.

The Transactions of the Society for the years 1841, 1842, 1846, 1847, 1848, 1852, 1857, 1858, 1859, 1860, 1861, are wanted, to complete sets, and members are requested to assist in obtaining them. Other volumes will be given in exchange, or payment made in money, if preferred.

New-York State Agricultural Society.

EXECUTIVE MEETING, MAY 4, 1872.

The Executive Committee met at the Agricultural Rooms, Albany, on Thursday, May 4, 1872, at 4 o'clock P. M.

There were present, the President; Vice-Presidents Wing, Thorne, Doncaster, Geddes, Angel and Pendry; the Secretaries; the Treasurer; Messrs. Thayer, Lewis, Juliand, Wadsworth, Bristol and Holmes of the Executive Committee, and ex-Presidents Faile and Hungerford.

Letters and excuses for non-attendance were received from Vice-Presidents Curtis and Diven, from Messrs. Swan and Cole of the Executive Committee, and from ex-Presidents Patrick, Campbell and Church.

The Secretary presented a letter from Vice-President Diven informing the committee that the Board of Supervisors of Chemung county had voted to raise the sum of $50,000 for a permanent Fair ground and buildings for the society at Elmira, which vote was to be submitted to the people of the county for confirmation on the 14th inst., in pursuance of the act passed at the present session of the Legislature.

Vice-President Angel made a verbal report with regard to obtaining a permanent location at Rochester, from which it appeared that there was no present prospect of doing so.

A communication was presented from Mr. James Vick, seedsman, Rochester, proposing to offer special prizes for flowers grown from seeds purchased of him, to be exhibited at the Fair this year, and on motion it was ordered that the offer be accepted.

The report of ex-President Lewis F. Allen, delegate from the society to the Agricultural Convention at Washington in February last, being presented and read, on motion it was ordered that the same be published in the Journal.

Delegations representing the cities of Watertown and Utica appeared and made application for the Fair this year, but neither delegation was prepared to guaranty compliance with the usual requirements of the society, or to make any definite proposition. On motion it was ordered that the President, Vice-Presidents Wing and Geddes, the Secretary and Treasurer, be a committee to decide where the Fair shall be held this year, and to receive proposals therefor until the 21st inst.

On motion, it was ordered that the time of holding the Fair be from the 16th to the 21st of September.

The following officers were assigned to the charge of the several departments at the Fair:

Cattle, Mr. Swan.
Horses, Mr. Wadsworth.
Sheep and swine, Mr. Juliand.
Poultry, Mr. Curtis.
Implements, Messrs. Geddes and Doncaster.
Grain and vegetables, Mr. Holmes.

Dairy and domestic, Mr. Lewis.

Manufactures and miscellaneous, Mr. Wing.

Fruits and flowers, Mr. Angel.

The Secretary reported having received ten pounds of Imperial Sugar Beet seed, imported from Germany by Prof. C. A. Goessman, Ph. D., of the Massachusetts Agricultural College, and presented by him to the society for experimental purposes, and the gift was ordered acknowledged with thanks, and the seed was distributed as follows:

Hon. S. D. Hungerford, Adams, Jefferson county.

James L. Ingalsbe, Esq., South Hartford, Washington county.

J. McD. McIntyre, Esq., Linlithgo, Columbia county.

Thomas J. Hand, Esq., Sing Sing, Westchester county.

Joseph Juliand, Esq., Bainbridge, Chenango county.

William H. Pendry, Esq., Albion, Orleans county.

Adin Thayer, Jr., Esq., Hoosick Falls, Rensselaer county.

Harris Lewis, Esq., Frankfort, Herkimer county.

Edwin Thorne, Esq., Thorndale, Dutchess county.

William M. Holmes, Esq., Greenwich, Washington county.

Samples to be sent in for analysis by Professor Goessman, and reports to be made.

And on motion the committee adjourned to meet at same place and hour on Tuesday, 21st inst.

VICK'S SPECIAL FLORAL PRIZES.

James Vick, of Rochester, N. Y., offers the following special prizes to be awarded at the New York State Fair of 1872 to his customers in this State. The flowers to be grown from seeds that have been purchased of him. The judges to be appointed by the society in the usual manner:

Cut Flowers, best and finest collection	$20 00
Phlox Drummondii, best collection	10 00
Asters, best collection	10 00
Balsams, best collection	10 00
Dianthus family, best collection	10 00
Pansies, best collection	10 00
Stocks, best collection	10 00
Gladiolus, best collection	10 00
Everlasting Flowers and Grasses, best collection	10 00

For Flowers grown by persons under 20 years of age.

Cut Flowers, best and finest collection	$10 00
Phlox Drummondii. best collection	5 00
Asters, best collection	5 00
Balsams, best collection	5 00
Dianthus family, best collection	5 00
Pansies, best collection	5 00
Stocks, best collection	5 00
Gladiolus, best collection	5 00
Everlasting Flowers and Grasses, best collection	5 00

PREMIUMS AWARDED AT THE WINTER MEETING, ON FRUITS AND IMPLEMENTS.

FRUITS.

20 varieties of apples, Peter Van Wie, Bethlehem,	$10
10 do Peter Van Wie, do	5
Dish of one variety of apples—1. William P. Ottley, Phelps	5
Dish of one variety of apples—2. Peter Van Wie, Bethlehem	Trans.
Seedling apple, Peter Van Wie, Bethlehem	$5
Collection of pears, O. B. Gridley, Deansville	10

MECHANICAL.

Skeleton harvester guard, H. H. Ingalsbe, South Hartford .... Certificate of merit.

Hand power circular and scroll saw, William M. Holmes, Greenwich .... Certificate of merit.

REPORT OF HON. LEWIS F. ALLEN,

REPRESENTATIVE OF THE SOCIETY AT THE AGRICULTURAL CONVENTION AT WASHINGTON, FEBRUARY 15, 1872.

BUFFALO, N. Y., *March* 5, 1872.

THOS. L. HARISON, Esq., *Corresponding Secretary, New York State Agricultural Society:*

Dear Sir: In compliance with your letter of appointment, I proceeded to Washington on 13th of February last, in order to be present as a delegate, to the convention called by the United States Commissioner of Agriculture for the 15th of the same month, and in which our society had been invited to a representation. Receiving no instructions from you, only in general terms to represent our society in the convention, and finding no specific purposes of action in the invitation circular sent to you by the Commissioner, I had only to exercise my discretion, as to the extent of my action in whatever subjects might be offered for either discussion or adoption.

The convention was called to order by the Commissioner soon after 10 o'clock A. M. on 15th February. The number assembled consisted of nearly or quite one hundred and fifty members, representing the State Agricultural and Horticultural Societies, State Boards of Agriculture, and Agricultural Colleges, wherever they had been organized or even contemplated, in every State of the Union—Louisiana, California and Oregon excepted. The gentlemen representing their several constituencies in the body were highly intelligent, zealous in advocating the interests of their institutions, and cordial in their intercourse with each other throughout the entire course of their proceedings.

At the organization of the convention, finding myself the sole official representative of our State Agricultural Society, I happily met Hon. Ezra Cornell, one of its ex-presidents, who, with two professors of Cornell University, had come there as delegates from that institution. On consultation with him, we both concluded that the largest State of the Union and the leading Agricultural Society in it should be more fully represented than by *one* delegate, and finding present John A. King, Esq., of our State Society, and E. W. Stewart, Esq., a prominent *practical* farmer and agricultural author of Erie county, we took the responsibility of associating them with ourselves as delegates in the convention. Thus the State Agricultural Society and Cornell University had each three members—a less number than represented some other States and Territories having less than a tithe of our area and population—of our joint delegated action there. It is enough to say that it was a *unit*, and perfectly harmonious.

As to the objects and proceedings of the convention, I hardly know what to say, and I doubt whether the Commissioner himself had a very definite idea of what he wanted to effect, or to what results it might lead; nor did the several delegates appear to be much better enlightened. For *one* thing they all appeared to entertain a wish, viz.: that the present bill before Congress touching the distribution of the proceeds of the public

land should inure to the benefits of education in the agricultural colleges in the several States, and to the promotion of agriculture, horticulture, and the mechanic arts in their various societies and associations—thus seeking to remedy the serious defects of the land scrip bill passed for the establishment of agricultural colleges in the year 1862. In this measure the opinions and action of the convention were unanimous and decisive; as also was the proposition to establish *experimental stations* at, or near the several colleges of the States and Territories for the trial and elucidation of whatever objects might offer, tending to promote the improvement of the agricultural and mechanical interests in their various localities, widely differing as they do in their productions.

Many new, and what is not at all strange, some absurd propositions were offered by sundry zealous, yet well intentioned men; but on canvassing them to a conclusion of their merits, or otherwise, they were satisfactorily disposed of, either by reference to proper committees to report upon in the future, or set aside as untenable.

All the doings of the convention cannot be enumerated in a report of this general character, and I must refer you to the official account of the proceedings, which it is understood will be soon forthcoming from the stenographic reporter employed by the Commissioner for the occasion. Suffice it, for the present to say, your delegation possessed themselves, so far as possible, of the various wants and necessities, views and opinions of the members from the several States represented, and gladly found in them a zeal and effort to elevate the interests of agriculture to their just dignity and importance throughout all sections of the country, as well as to cultivate a spirit of friendly intercourse with, and aid to each other in all matters promotive of their joint and individual prosperity, regardless of locality or representation.

At the conclusion of their proceedings a resolution was passed to again convene at Washington on the third Wednesday of February, 1873, at a meeting of delegates of like character, and on a basis of representation with the present convention, believing as the members unanimously expressed themselves, that marked and beneficial results will follow.

It is gratifying to add that several eminent members of Congress, both of the Senate and House of Representatives, members of the Committee on Public Lands and others, attended the convention at different stages of its proceedings, and gave their decided approbations to the measures advocated by the latter for aid through the proceeds of the sale of the public lands. Had nothing but this last measure been considered by the convention, its action would have been of signal importance to the welfare of the country, and its educational and agricultural interests at large. Yet further beneficent results are to be hoped for. The friendly intercourse of so many intelligent minds brought together on such an occasion from distant States, and after several years of sectional estrangement with some of them, cannot be otherwise than productive of benignant results, redounding to the welfare and happiness of the whole people of our country.

As a recognition of the valuable objects of the convention, the President of the United States honored them with his presence on one of the days of its proceedings.

Respectfully submitted,

LEWIS F. ALLEN.

FORESTRY.

A paper read at the Annual Meeting of the New York State Agricultural Society, at Albany, N. Y., Feb. 15, 1872, by Andrew S. Fuller, of the *Rural New Yorker*.

No one who has paid the least attention to the subject of Forestry will for a moment doubt its importance. There was a time, in our history as a nation, when forests were great obstacles in the way of progress, but that day has long since passed, and we now begin to feel the need of more and better timber even in the once heavily wooded regions of the Atlantic States, where, within the memory of men now living, entire counties were an unbroken forest.

It is true that a very small portion of these forests have been used for industrial purposes or for fuel, but the fact is apparent that they are gone, or going at the rate of four millions of acres annually. If the people of the Eastern States begin to feel the importance of saving and restoring their forests, what shall be said of those who reside in the sparsely-wooded regions of the West? It is unnecessary to say anything in regard to the value of timber to individuals, communities, or nations, for this is well understood, at least by those who have been once deprived of a full supply.

I believe that there can be no question in regard to the great scarcity of timber which exists in many localities, and that some of our industrial pursuits are being more or less retarded for the want of the requisite quantity and quality of timber. In addition to the immediate necessity of producing a valuable supply of timber, something might be said in regard to the influence of forests upon climate. I am well aware that there are able men who oppose the idea of forests having any perceptible climatic influence, and while giving these men credit for honesty, I cannot help believing that their want of capability to analyze the subject in all its phases, is the main reason why they hold their present rather untenable position. To arrive at a correct conclusion, we must take a broader view of the subject, than to draw inferences from a few isolated instances. A few rain drops are not a copious shower, neither is a wooded township a great forest. The amount of rain which annually falls in a country, may or may not be perceptibly increased or decreased by the presence or absence of forests, but its distribution and evaporation is certainly, in a great measure, regulated thereby.

A great amount of water may fall in a few showers at a certain season, and still the climate be so dry as to be almost uninhabitable the remainder of the year. One-half the amount of water, if distributed through a longer period, might be all that was necessary to make the soil fertile and the climate delightful. Probably every one who is familiar with the history of the old world can call to mind instances of this kind, where the annual amount of rainfall has not materially decreased, and still the countries have become almost, if not quite, an arid desert, through the destruction of its forests. Forests also have considerable influence in regulating the temperature, as well as the hygrometic conditions of the atmosphere.

Wherever an extensive region of country is denuded of its trees, the winds pass over it with greater velocity, drying the soil by rapidly dispelling the moisture that arises therefrom. Sudden floods are also more frequent and destructive in treeless, hilly countries, in consequence of the removal of natural impediments which hold the water in check, such as the accumulated vegetable matter, always more or less abundant in the smaller streams, as well as the leaves and leaf-mold in the forests, which retard the flow of water in its downward course into valleys, rivulets and rivers.

FORESTERS NEEDED.

Forestry has received so little attention in this

country, that the information heretofore disseminated relating thereto has been of the most meagre and unsatisfactory kind. But the time has arrived when our people need practical instruction in regard to the best methods of rearing new forests, as well as of preserving those which they already possess. Perhaps one of the most direct and practical ways of bringing this subject prominently before them would be to appoint a forester, whose duties should consist in not only taking charge of forests belonging to the State, but in giving instruction to farmers in all that relates to forestry. We have able entomologists to impart information in regard to the insects which infest our gardens, fields and forests; also, commissioners who take charge of our schools, banks, insurance companies, and fisheries, and of almost every other kind of internal improvement with the bare exception of our forests, which are undoubtedly of equal importance with any of the departments I have named. Is not this a great oversight in our government officials? and are we not losing millions of dollars annually which might be saved by a proper expenditure of a few thousands for this purpose?

Our people need practical information in regard to the best method of raising trees from seed, and to the time and manner of planting and transplanting, as well as caring for old trees. A great amount of valuable information may be given in books and newspapers, but a few field or forest lectures, with practical illustrations in planting and pruning, would be of more value to a majority of our people than all the arboricultural literature extant.

CONSIDERATION OF THE QUESTIONS.

In the printed list of questions to be discussed at this meeting, and to which direct answers are desired, there are several worthy of more than ordinary consideration. But as it would require too much time for me to take up each separately and treat it at length, I will only briefly allude to a portion commencing with the 4th, to wit: "What kinds of timber yield the greatest profit to foresters?"

To answer this question in a general way I would say deciduous trees, evergreens requiring greater age before becoming available for the purposes for which the timber is used. The next question which would naturally arise would be, for what purpose the timber was required. Hoop poles in some portions of the country would yield a greater profit and be produced in less time than any other kind of timber. In other localities where this article is not in demand timber required for railroad ties might be the most profitable, such as larch and chestnut, both being among our most rapidly growing and durable timber. The locust tree should certainly be added in regions where the "locust borer" does not attack it.

5th. "What length of time elapses between the planting of the seed and maturity of the tree for cord wood?" and

6th. How long between the planting of the seed and maturity of the tree for timber?"

The silver maple (*Acer dasycarpum*) is one of the most rapidly growing trees we possess, and is adapted to the climate and soil of this State. Its seeds ripen in June, and if sown immediately and covered lightly, seedlings two to three feet high may be produced the first year. The following spring they should be transplanted into nursery rows about four feet apart, and the trees twelve to eighteen inches apart in the row. At this distance eight to ten thousand trees can be set on an acre. The trees should be thinned out annually until those remaining have sufficient room to mature. I have raised this species of maple from seed which at four years old were four inches in diameter at the base, and fifteen feet high; at ten years of age a foot in diameter, and sufficiently large to be cut into cord wood. It is true that the wood is not so valuable as the sugar maple, or hickory, but it can be produced in less than one-half the time.

It will require fifteen to twenty-five years to produce trees large enough to be hewn or sawed into lumber which will answer for the frames of barns or other buildings. Another merit of this species of maple is its adaptation to dry as well as moist soils, growing rapidly even on sandy plains.

The red maple (*Acer rubrum*) ripens its seed at the same time as the silver maple, and both need the same treatment, but the former is not so rapid a grower, and requires a rich moist soil. The timber is similar, but of the two trees the silver maple is far preferable for cultivation.

The sugar or rock maple (*Acer saccharinum*) is certainly one of our most valuable forest trees. The seed ripens in autumn, and although they may be sown at this time, I have found that mixing them with sand and keeping them in a moist, cool position until spring, is a better way. If sown in autumn, the earth is likely to become so hard and compact over them that a portion, at least, will fail to break through. They should be sown in nursery rows, and transplanted when one or two years old.

To avoid repetition, allow me to be a little more explicit in regard to transplanting seedlings. All seedling fruit or forest trees should be transplanted while young as a hastening process, as well as to insure safe removal in later years. Transplanted seedlings grow more rapidly than untransplanted, and when the operation is properly performed, a tree will be as large in ten years as it would have been at twenty, if allowed to remain where the seed was sown or naturally grew as it fell from the parent tree. I do not know of any exception to this rule for the hickory, butternut, and black walnut, which are generally considered difficult trees to remove. If transplanted when one or two years old, and deprived of the greater portion of their tap-root, they will throw out numerous side or lateral roots, which not only causes vigorous growth, but insures success in transplanting. One of the most erroneous theories ever promulgated is that a tree will grow more rapidly and remain healthy longer if it is never meddled with from the time the seed is placed in the earth. Such a theory belongs to the barbarian and non-progressive ages, and not to the nineteenth century.

But to return to the tree under consideration. The sugar maple is comparatively a slow grower during the first half dozen years from seed, but after it gets well established, it makes a rapid growth. If cultivated for fuel or for sugar, the trees should be given an abundance of room, because the roots will naturally extend to a considerable distance laterally. From my observation and acquaintance with this tree I think that twenty-five years are required to produce specimens large enough for cordwood or available for sugar.

HICKORIES.

There are such a number of species of the hickory, all of which are not adapted to the same kind of soil, that some care will be necessary in making a selection for plantations. Some of the species appear to succeed best upon a rather light or open porous soil, such as sandy or stony ridges and steep declivities; while others, like the common shell-bark hickory (*Carya alba*) and the bitter-nut (*Carya amara*) prefer a moist, rather compact soil. They are all naturally very slow growing trees; but with cultivation and proper pruning, timber large enough for making farm implements can be produced in fifteen to twenty years. There is one thing to be said in favor of the hickories which is applicable to but few other native trees, and it is, that the first cutting of a hickory forest may be made available for hoop-poles; and if they are removed at the

proper season, the stumps throw up sprouts which will grow so rapidly that the check in growth is scarcely perceptible after a few years.

THE ASH.

The remarks that I have made in regard to the hickories are equally applicable to the different species of the ash. The white ash (*Fraxinus Americana*) and blue ash (*F. quadrangulata*) are the two most valuable native species for cultivation upon moderately dry soils, while the green ash (*F. verdis*) and black or water ash (*F. sambucifolia*) are more suitable for low wet soils. The first two are trees deserving of special attention, on account of their valuable timber for all kinds of agricultural implements. The seeds ripen in autumn, and should be treated the same as other kinds which ripen at this season. The young seedlings produce a great number of small fibrous roots, and consequently are easily transplanted without danger of loss. The trees grow more rapidly than the hickory, and arrive at an available size in less time.

THE ELM.

The two most valuable Northern species of the elm are the white, or weeping (*Ulmus Americana*), and corky white elm (*Ulmus racemosa*). These trees are more valuable while young, in comparison to the amount of wood produced, than when old or very large. When small, the trees are valuable for hoop-poles, and at the age of ten to twenty years their stems are in great demand for wagon hubs and other purposes where a very tough timber is required. The seeds ripen with the silver and scarlet maple, or a little earlier, and should be treated in the same manner. There is no tree more readily propagated or more satisfactory in growth than our common weeping elm, as it will flourish on almost any soil which is not too dry.

BLACK WALNUT.

This is a valuable tree, but its timber is not available until of great age, at least not for the purposes to which it is generally applied. From thirty to fifty years are required to produce black walnut lumber suitable for cabinet work. This tree. however, should not be neglected, even if no immediate profit can be expected from its culture, for a few specimens, interspersed here and there among other species would always enhance the prospective value of a plantation; and I am not certain but a black walnut plantation would be a good investment, and, like Government bonds, payable many years hence at a low rate of interest, would always command purchasers at par, if not above.

There are several other species of native forest trees that might be placed in this list of trees, chiefly valuable when of large size, such, for instance, as the white wood (*Liriodendron tulipifera*), basswood or linden, beech, birch, and butternut. But if we are to cultivate trees, it is useless to spend time upon inferior kinds.

THE CHESTNUT.

I might have placed this trees higher upon the list of valuable trees, but it is so well known that there is little danger of any one mistaking its position. In rapidity of growth upon dry soils it has few equals. Ten to twenty years are necessary to produce trees from the seed of a size large enough for fence posts or rails, and about twenty to twenty-five for railroad ties.

THE EUROPEAN LARCH.

Considerable attention has been given to the culture of this tree in the past few years, and from present indications it will prove to be as valuable here as in Great Britain, where many thousands of acres are now covered with larch forests. The tree grows so rapidly that timber large enough for railroad ties can be produced within twenty years from planting. For the first few years the seedlings require careful culture.

TRIMMING.

7th. "Should trees be trimmed or left untrimmed in plantations? If they should be trimmed, what is the best method?"

I should as soon adopt the system of non-cultivation as of non-trimming of trees. Branches that are carefully cut off close to the main stem, are not nearly so liable to decay, and disease the whole tree, as when left to die and drop off naturally. Besides this, when a proper system of pruning is pursued, all the vital forces of the tree can be directed into channels leading to desired results.

It would be difficult to lay down any set of rules as the *best method* of pruning, because different species as well as individual specimens of each may require special treatment. For instance, certain specimens may become stunted and dwarfed in growth, and the best method of restoring vigor would be to cut the stem down to its very base, depending upon a chance shoot from the root for the future tree. In cultivating or in restoring plantations of oaks, hickories and chestnut, this is often practiced with the best results. Pruning will often do more toward increasing the growth of a tree than the best of culture. Again, the method of pruning would have to be varied in accordance with the form desired in the trees. If a tall slender stem was of more value than one of less height and greater diameter, then the trees should be planted nearer together and the lower branches removed as rapidly as possible without checking growth. A slight acquaintance with the general principles of vegetable physiology, and a little observation and practice will usually be sufficient to enable any one to do what little pruning is necessary in a plantation.

8th. "Is it more profitable to renew wood lands by planting or by leaving them to grow up naturally by sprouting or otherwise?"

This would depend very much upon circumstances. If the natural growth of trees were of a valuable kind, and of those species which readily produce healthy sprouts from roots or seed, it might be more profitable in the end to encourage such a second growth than to replant with other kinds. There are thousands of acres of uncultivable lands now occupied with choice timber, and with such it would be poor policy to destroy all and undertake to replant. There are few of our natural forests which do not contain more or less valuable species which might be encouraged, and the less valuable destroyed.

There is certainly a great lack of proper discrimination among farmers in regard to the preservation of valuable timber trees. Whenever a certain tract is set aside as permanent woodland, the greatest care should thenceforth be given, not only in removing trees that have arrived at maturity, but in preserving the most valuable of the young growth. It may also be well to introduce valuable species not natives of the locality; but this as a general rule will be found quite difficult in old forests.

If it is desirable to remove all the timber from land easily brought under cultivation, then it would be better to make thorough work of it, and after subduing the land, plant it with the most desirable species.

Our people do not as yet fully realize the importance of this subject, but the time is not far distant when the restoration, cultivation and preservation of forests will rank among the greatest of our many very important industries.

Table showing the rainfall in the State of New York during the growing season for nine years past, as reported by the Agricultural Department, Washington—the stations grouped in districts.

Station.	County.	Rainfall for seven months of 1863.							Rainfall for seven months of 1864.							Rainfall for seven months of 1865.						
		April.	May.	June.	July.	Aug.	Sept.	Oct.	April.	May.	June.	July.	Aug.	Sept.	Oct.	April.	May.	June.	July.	Aug.	Sept.	Oct.
Rochester	Monroe.....	2.79	1.83	1.37	5.03	3.70	1.51	2.72	3.23	6.54	1.57	1.66	5.49	1.83	5.51	3.03	3.30	5.43	1.47	1.04	4.33	4.29
Buffalo	Erie	......	......	1.42	4.37	2.96	......	4.00	3.22	6.32	.91	1.50	7.57	......	5.73	4.00	3.38	2.78	1.67	.89	3.29	3.00
Geneva	Ontario.....	......	......	......	......	......	......	......	......	......	......	......	7.14	......	4.18	2.66	3.92	3.56	2.90	1.94	4.86	3.43
Oswego	Oswego	6.25	5.00	......	4.35	5.25	......	......	4.37	6.73	.88	1.00	6.66	1.85	5.72	3.58	2.60	5.95	2.35	1.13	3.30	6.32
Palermo	Oswego	......	......	......	......	......	......	......	......	......	......	......	......	2.70	6.00	2.70	3.30	8.80	3.00	1.10	4.20	5.60
Cazenovia	Madison	......	......	......	......	......	......	......	......	......	......	......	......	......	......	4.23	3.99	3.61	......	......	......	......
Utica (Clinton).....	Oneida	1.07	2.97	......	5.46	5.84	......	2.97	2.38	3.73	1.15	2.39	7.56	2.72	......	......	......	......	......	......	......	......
Oneida	Madison	......	......	3.18	8.88	12.73	......	......	......	......	2.08	......	12.53	......	7.11	6.26	5.40	5.58	6.21	1.58	9.16	7.84
South Trenton	Oneida	......	......	......	......	......	......	......	......	......	1.71	2.70	7.95	3.64	6.33	7.20	2.85	5.40	5.77	1.22	2.96	4.78
Houseville	Lewis	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1.20	......	......
Theresa	Jefferson ...	2.59	2.65	2.38	1.28	2.41	2.62	3.87	4.75	8.00	.77	.76	3.49	4.30	6.26	3.73	3.03	4.04	2.71	1.22	2.67	4.36
Depauville..........	Jefferson ...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	4.10	7.00
Gouverneur	St. Lawrence	1.66	2.13	1.28	2.84	1.75	......	......	3.21	3.27	.50	.74	2.65	5.65	4.30	3.13	1.51	3.91	1.85	.99	2.36	3.22
Jamestown	Chautauqua.	......	......	......	......	......	......	......	......	......	.50	4.50	9.50	3.80	7.80	4.30	4.30	7.30	6.30	2.30	8.80	1.30
South Hartford	Washington.	......	......	......	......	10.12	......	2.60	5.75	6.28	.82	1.95	7.68	4.55	4.35	2.70	7.53	3.99	4.56	.95	2.08	2.27
North Argyle	Washington.	......	......	......	......	......	......	......	......	......	1.04	2.96	6.69	......	......	......	......	......	......	......	......	......
Fishkill Landing...	Dutchess....	......	3.22	1.91	9.11	3.86	......	4.36	3.29	3.14	1.24	2.37	9.56	2.62	2.70	2.37	6.45	3.78	4.54	1.56	1.48	3.05
Newburgh	Orange	......	......	......	......	......	......	......	......	......	......	......	......	......	......	2.20	7.00	4.10	4.10	1.39	1.50	3.60
Schenectady	Schenectady	......	......	......	......	......	......	......	3.38	......	.75	......	......	......	......	Alba	ny ...	......	3.98	1.37	2.80	4.59
Troy	Rensselaer..	......	......	......	......	......	......	......	......	......	......	......	4.97	......	......	......	5.93	1.74	......	......	.	......
Deaf & Dumb Asylum	New York ..	5.69	4.57	1.43	......	......	......	......	3.28	5.24	......	3.20	5.19	5.45	2.68	4.14	5.56	10.42	5.21	2.23	4.21	4.94
Columbia College...	New York ..	......	......	......	......	......	......	......	......	......	......	......	......	......	......	2.97	3.97	2.97	......	......	......	3.16
St. Xavier College..	New York ..	......	......	......	......	......	......	......	......	3.79	2.59	1.20	1.66	5.14	2.16	3.77	......	......	......	......	......	......
Throgs Neck........	Westchester.	......	......	......	......	......	......	......	2.24	3.80	2.66	2.11	3.72	4.90	2.29	......	......	......	......	......	......	......
Flatbush...........	Kings	......	......	......	......	......	......	......	2.35	3.00	2.75	2.30	2.82	4.34	2.04	4.24	5.63	3.58	3.54	2.90	2.21	5.75
Moriches	Suffolk	......	......	......	......	......	......	......	2.74	......	2.30	......	3.04	......	2.75	4.75	5.97	2.28	3.69	1.50	3.53	4.06
Garrisons	Putnam	......	......	......	6.81	......	......	......	3.96	3.10	1.84	2.85	8.24	3.40	2.46	3.00	7.11	6.54	5.04	1.30	2.02	4.64

Station.	County.	Rainfall for seven months of 1866. April.	May.	June.	July.	Aug.	Sept.	Oct.	Rainfall for seven months of 1867. April.	May.	June.	July.	Aug.	Sept.	Oct.	Rainfall for seven months of 1868. April.	May.	June.	July.	Aug.	Sept.	Oct.
Rochester	Monroe	3.20	2.90	3.90	1.36	4.91	4.11	1.22	2.93	5.69	1.40	3.54	.72	2.28	1.92	1.86	6.36	2.87	.68	3.22	7.51	1.67
Suspension Bridge	Niagara	....	....	....	....	....	....	....	....	....	....	....	....	1.90	2.00	....	....	2.65	.50	2.50	3.75	3.60
Buffalo	Erie	2.61	4.86	2.85	1.47	4.44	7.75	2.41	3.51	4.26	1.77	1.54	.29	2.35	2.43	1.86	4.35	2.51	3.11	2.43	5.06	2.55
Geneva	Ontario	2.16	2.27	4.42	2.07	3.22	4.58	1.83	3.91	6.59	2.05	2.64	.96	.09	1.50	2.38	3.74	3.12	.85	1.29	....	....
Oswego	Oswego	3.33	2.88	4.81	2.33	3.73	5.31	3.77	3.62	6.57	1.41	1.94	2.53	2.19	1.28	1.53	3.35	3.14	1.93	3.13	4.71	.92
Palermo	Oswego	2.90	2.70	4.80	2.89	4.10	7.30	4.30	....	6.90	1.60	2.40	1.60	2.30	1.00	1.50	2.60	2.80	.70	2.70	4.10	1.40
Cazenovia	Madison	....	....	....	....	....	....	....	5.09	....	....	....	....	....	....	....	....	....	....	....	....	....
Oneida	Madison	1.72	4.37	10.48	5.78	7.05	9.08	3.08	7.39	12.61	7.43	5.96	5.15	5.67	4.12	3.99	10.05	6.83	5.97	6.60	10.70	2.47
Minaville	Montgomery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.71	7.40	3.30	1.10	2.89	6.26	2.16
South Trenton	Oneida	1.32	4.21	7.14	5.07	4.49	8.07	2.76	6.09	7.62	5.30	.86	3.34	5.18	3.84	3.04	7.74	3.82	....	....	7.15	2.49
Houseville	Lewis	....	....	....	4.47	4.69	7.92	3.23	5.78	6.82	2.24	4.12	3.33	2.48	3.80	2.74	1.61	4.53	4.35	4.88	5.35	4.18
Depauville	Jefferson	2.29	3.74	4.08	3.01	5.30	6.42	3.44	3.95	5.90	2.22	2.18	2.05	.57	3.94	3.25	5.48	2.04	1.00	3.43	4.45	3.60
Theresa	Jefferson	....	....	....	....	....	5.58	3.01	....	6.90	1.13	....	....	....	....	2.43	....	....	....	....	....	....
Gouverneur	St. Lawrence	2.46	3.06	4.14	2.45	5.96	6.02	2.61	4.42	6.92	1.73	2.52	1.99	2.76	3.09	1.65	4.23	1.83	1.91	1.25	3.59	1.95
North Hammond	St. Lawrence	3.07	....	8.74	3.21	9.63	10.44	4.14	5.60	8.00	1.33	4.17	3.45	1.10	5.08	.99	5.37	.72	1.00	1.55	5.60	1.59
Little Genesee	Allegany	....	....	1.75	1.88	....	3.40	2.25	1.95	8.70	1.50	3.30	4.00	2.02	1.10	1.75	3.65	3.95	1.90	1.65	2.95	2.25
Friendship	Allegany	....	....	....	....	....	....	....	....	....	1.90	2.45	1.42	2.81	....	....	....	....	....	....	....	....
South Hartford	Washington	.68	1.06	3.65	2.46	4.34	5.28	1.07	4.30	8.50	10.95	3.73	2.50	1.30	2.72	2.95	6.20	2.90	.80	1.84	....	2.81
Fishkill Landing	Dutchess	1.92	4.63	4.41	3.40	4.75	....	3.03	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Germantown	Columbia	....	4.30	6.80	1.10	6.20	6.50	3.50	6.90	8.60	5.40	1.80	5.80	....	4.10	5.60	....	....	....	....	....	....
Newburgh	Orange	1.90	4.40	4.40	4.10	5.50	3.20	2.19	1.49	5.57	5.02	3.11	9.23	1.87	5.86	4.15	6.82	3.22	1.62	5.88	....	.72
Fishkill	Dutchess	....	4.63	4.41	3.40	4.75	....	3.03	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Albany	Albany	1.66	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Troy	Rensselaer	1.45	2.43	6.71	3.85	....	....	....	3.21	5.74	3.24	3.42	7.29	.15	3.20	3.77	6.33	3.20	2.35	3.85	8.48	1.58
Deaf & Dumb Asylum	New York	4.09	4.46	4.38	....	4.81	4.85	5.28	2.47	5.70	10.18	5.76	7.70	....	5.12	6.42	7.19	5.86	6.44	8.31	9.60	2.01
Columbia College	New York	2.40	3.59	2.35	1.67	3.84	2.97	1.70	1.96	3.94	5.37	3.83	6.72	....	2.11	2.65	5.84	3.59	4.72	5.25	8.81	.88
St. Xavier College	New York	....	....	....	....	....	3.15	4.66	2.85	5.75	....	....	....	1.00	4.47	....	....	....	....	....	....	....
Flatbush	Kings	2.71	....	2.23	3.32	4.38	3.86	3.49	2.94	4.02	....	2.57	8.63	1.08	4.74	1.55	5.08	3.35	5.27	2.90	5.99	2.66
Moriches	Suffolk	2.85	6.62	2.56	5.47	6.63	5.50	4.14	1.33	5.64	8.13	4.65	5.60	1.50	6.82	9.34	8.91	2.74	5.92	4.07	8.03	1.00
Garrisons	Putnam	2.51	4.44	5.64	3.83	5.29	5.14	5.84	3.14	7.86	4.93	4.20	10.75	2.84	4.26	5.47	8.08	4.43	1.63	6.23	10.30	1.05
Stapleton	Richmond	....	....	....	....	....	....	....	....	....	....	....	....	....	3.83	....	....	....	....	....	....	....

Station.	County.	Rainfall for seven months of 1869.							Rainfall for seven months of 1870.							Rainfall for seven months of 1871.						
		Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
Rochester	Monroe	1.47	2.56	6.62	4.90	4.60	5.11	2.83	2.75	.78	2.96	4.72	3.26	5.01	.....	2.75	1.70	4.20	3.00	4.90	.50	1.55
Suspension Bridge	Niagara	.....	.....	.....	.....	.....	.....	.....	1.20	.80	5.35	4.25	3.35	3.85	3.25	3.50	1.30	.....	.....	.....	.....	.....
Lockport	Niagara	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.37	2.79	2.52	3.75	2.39	2.26	1.65	3.07	2.85	5.83	1.40	1.15
Carlton	Orleans	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.50	1.38	1.81	1.88	3.25	1.00	1.25
Buffalo	Erie	1.77	2.18	5.19	4.57	3.98	7.43	3.30	1.15	1.51	6.30	3.10	1.58	3.92	4.55	2.68	1.99	3.65	.....	4.43	.....	1.70
Himrods	Yates	.....	4.50	3.94	4.06	3.31	3.06	3.19	3.06	3.19	2.69	5.06	1.63	3.19	1.06	.....	.....	.....	1.80	3.06	.50	1.38
Oswego	Oswego	2.00	2.08	3.92	6.67	4.20	3.65	5.10	1.38	.83	2.15	4.72	3.50	2.28	4.98	2.88	1.83	2.28	2.62	5.91	1.04	1.62
Palermo	Oswego	1.70	3.10	3.00	4.70	2.60	3.80	5.10	1.50	.30	.70	3.70	.50	3.75	2.20	2.80	.06	2.10	1.40	5.20	1.20	1.20
Utica	Oneida	.....	.....	.....	.....	.....	.....	.....	1.36	1.86	3.29	6.69	7.26	3.10	4.36	.....	.....	.....	.....	.....	.....	.....
Oneida	Madison	4.34	5.69	9.66	12.14	5.95	5.14	8.93	2.41	3.36	4.59	6.73	14.40	7.20	4.96	7.71	4.12	8.73	4.49	5.40	1.71	4.38
Minaville	Montgomery	1.45	3.05	4.40	5.05	2.15	4.70	7.20	5.65	2.90	3.50	3.65	2.30	2.40	1.95	Amsterdam		6.45	.....	.....	.....	.....
South Trenton	Oneida	4.91	3.71	6.46	10.72	5.22	5.28	5.63	2.54	2.77	3.81	6.50	7.01	1.18	8.00	4.41	2.97	.....	4.00	.....	.....	3.86
Cooperstown	Otsego	.....	.....	.....	.....	.....	.....	6.10	2.36	1.94	.95	4.14	2.74	2.76	3.80	2.66	3.18	5.25	4.64	4.50	1.17	1.97
Leyden	Lewis	4.06	3.81	5.31	6.04	4.84	6.25	7.60	1.75	1.29	.....	3.09	.....	Lowville		2.78	2.20	1.94	2.58	3.58	.94	1.42
Houseville	Lewis	2.69	3.59	3.39	7.96	2.86	6.12	6.97	1.39	1.30	.80	3.95	2.51	4.06	4.99	.....	.....	.....	.....	6.31	.....	.....
Depauville	Jefferson	1.10	4.08	3.09	3.65	2.75	6.95	7.10	1.15	1.34	2.27	1.58	1.37	4.57	3.98	3.70	1.82	2.80	2.68	4.40	3.05	2.00
Gouverneur	St. Lawrence	1.18	4.10	3.81	3.13	1.74	4.05	5.67	.96	1.01	3.50	2.37	1.87	4.10	3.64	.....	1.76	1.58	3.33	2.84	1.48	1.63
North Hammond	St. Lawrence	.95	3.85	3.10	1.54	1.74	5.30	7.24	.65	.68	.97	1.27	2.06	3.13	6.72	4.60	2.19	1.88	4.23	3.21	.69	.....
Canton	St. Lawrence	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.71
Little Genesee	Allegany	1.55	2.95	4.32	6.13	2.46	4.75	2.06	2.49	1.42	4.57	3.86	3.21	3.54	2.13	2.39	1.64	3.62	3.32	3.48	.50	2.00
Jamestown	Chautauqua	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.00	1.60	3.30	.....	.....	1.30	2.10
Angelica	Allegany	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.01	2.57	3.02	3.72	.68	2.15
Newark Valley	Tioga	2.30	3.50	3.00	4.20	.....	3.90	4.10	2.50	3.10	3.40	2.80	.....	2.20	3.80	2.40	3.90	3.60	5.40	5.90	.50	2.10
South Hartford	Washington	.....	2.10	5.05	3.12	.....	3.10	18.85	1.85	.65	3.35	3.70	1.45	2.15	2.95	1.95	2.10	3.25	5.45	9.10	2.90	3.50
North Argyle	Washington	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.50	.....	3.47	5.22	5.70	.....	3.58
Caldwell	Warren	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.00	6.55	5.35	8.45	Warrensburgh			8.15	3.47	.90	.....
Glasco	Ulster	.....	.....	4.83	1.46	1.54	3.07	9.15	7.27	2.00	3.13	1.50	4.40	2.34	.....	.....	7.30	6.35	3.11	7.35	1.38	2.88
Hudson	Columbia	.....	.....	3.72	3.67	2.40	3.68	14.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Newburgh	Orange	.92	4.33	2.85	2.60	1.42	4.30	11.91	3.12	2.49	4.68	2.55	.....	1.65	5.04	.....	.....	West	Day,	Saratoga		2.85
Sloansville	Schoharie	3.41	.....	.....	.....	.....	.....	.....	.....	.....	.....	Middleburgh			.....	.....	5.20	6.10	8.40	4.50	.80	1.30
Poughkeepsie	Dutchess	.....	.....	.....	.....	.....	.....	.....	2.41	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Troy	Rensselaer	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7.24	.....	.....	.....
Columbia College	New York	1.39	3.32	3.31	3.18	1.71	2.72	6.30	5.60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Deaf & Dumb Asylum	New York	1.57	5.45	4.72	4.45	1.85	4.07	6.78	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cooper Union	New York	.....	.....	.....	.....	.....	.....	.....	5.61	3.08	2.85	4.72	3.79	2.38	5.72	3.45	4.90	8.02	6.27	6.41	1.85	7.72
Brooklyn	Kings	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.38	4.00	3.90	1.70	5.50	3.84	3.90	6.45	5.53	9.91	2.00	5.35
Rutgers F. C.	New York	.....	.....	.....	.....	.....	.....	.....	3.91	2.55	1.02	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Flatbush	Kings	1.56	3.61	6.46	2.23	2.11	3.46	6.77	4.18	2.63	1.73	2.81	3.06	1.29	.....	5.30	2.78	5.81	5.05	9.74	3.50	2.40
Moriches	Suffolk	3.42	7.82	6.22	2.99	2.15	5.69	12.86	4.24	2.38	1.12	2.41	5.85	2.65	3.76	4.31	2.37	3.79	5.36	3.18	2.03	5.23
Garrisons	Putnam	1.95	5.00	1.47	1.70	1.33	4.26	10.49	3.84	2.98	3.00	2.97	1.91	2.55	5.33	2.98	2.11	5.29	4.63	6.12	1.47	4.47
Nyack	Rockland	1.62	4.42	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

BEET SUGAR.

(Communicated to the *Fredonian*, New Brunswick, N. J., by Professor Cook, of the New Jersey Agricultural College.)

The Legislature at its last session passed a law to encourage the manufacture of beet sugar, of which the following is a copy:

An act to encourage the manufacture of Beet Sugar in this State.

1. Be it enacted by the Senateand General Assembly of the State of New Jersey, that for the term of ten years next after the passage of this act, all the machinery, buildings, real estate and all other property owned by any individual or individuals, corporation or corporations organized under any law of this state, and used exclusively in the business of manufacturing beet sugar, are hereby exempted from taxation for any purpose whatsoever; provided that this exemption from taxation shall not apply to lands upon which beets are raised for the purpose of manufacture.

2. And be it enacted, That the stock of any incorporated company engaged exclusively in the manufacture of beet sugar in this state, held and owned by any individual or individuals, shall be exempt from taxation for any purpose for the time specified in the first section of this act.

3. And be it enacted, That this act shall take effect immediately, and be in force from and after its passage.

Approved April 4, 1872.

The manufacture of beet sugar has grown to immense proportions in Europe within the last few years. A writer in the annual report of the Commissioner of Agriculture for the year 1870, says, that in the preceding year there were in all Europe 1,800 factories, and that they produced 611,000 tons of sugar. The business has begun in our own country; there are two factories in successful operation in California, and one or two small ones are working satisfactorily in Wisconsin. There is an abundance of land in our state that can be devoted to the culture of the beet, and when it is considered that the raising of beets is everywhere attendant on good farming, it becomes an object of interest to our farmers. The manufacture will probably be carried on by capitalists, as it requires a large investment of money, but they will necessarily depend upon purchasing their beets from farmers. A single factory of medium size consumes 13,000 or 14,000 tons of beets per annum, producing from 1,000 to 1,100 tons of sugar, 300 tons of molasses and 2,800 tons of pulp. In most cases the profits are not willingly given, but in one instance it was ascertained that the annual expense of manufacture, besides interest on capital, was $94,000 in gold, and the receipts from sales were $160,000, leaving for interest on capital and profits $66,000. The prosperity attending the business generally leads to the belief that the above is not an uncommon case. The cost of a factory and its whole machinery must be from $100,000 to $150,000.

The introduction of this business in this state must begin with raising the beets; and for this purpose trials as to the methods and cost of cultivation need to be made. Farmers are entirely safe in raising the beets, for they make excellent feed for stock, being quite equal to carrots, mangold wurzels or turnips for that purpose, and from ten to twenty tons an acre can easily be raised. On the farm of the State Agricultural College, last year, two kinds of sugar beets were raised, the Silesian, which yielded eighteen tons an acre on good ground, and the Nursery, on poorer ground, which yielded nine tons an acre. They were cultivated in rows twenty-eight inches apart, and about ten inches apart in the rows. The planting was in the latter part of May. The following is a copy of the instructions given by the Rhenish Beet Sugar Company at Cologne, Germany, for the guidance of farmers in raising beets for the factories.

Rules for Sugar-Beet Growers.

"1. In order to grow good sugar-beets it is necessary that the land intended for the roots should be ploughed at least ten inches deep before the winter. As the frosts render the soil as fine as ashes, it enables the farmer to work the land readily in spring, and the rapid growth of the plant is greatly facilitated.

"2. From experience it is proved that roots planted in ground freshly manured, either with farmyard dung or compost, suffer from unequal growth and various kinds of insects. The quality also in most cases is inferior. It is better, therefore, to highly manure the previous crops, and avoid the direct application of manure to the beet field.

"3. As soon, in the month of April, as the land has become sufficiently warm (say 45 to 50 deg. Fahrenheit), the sowing of the seed should commence, for, according to all experience, the earliest planted beets are always the best. Drilling in all cases is to be preferred to sowing by hand. The cultivator should always bear in mind that the soil should be as fine as meal, yet not too loose, so that the seed is not deposited too deep.

"4. If sown by hand, the roots should be 14-inch squares; within the radius of the Cologne fortification, a rich district, the row should be 12 inches wide and the roots 8 inches apart, so that they do not become too big. If drilled with a machine, the distance should not exceed 15 inches, and thinned out at 10 inches.

"5. As soon as the plants are visible, hoeing between the rows should commence. The growth of the weeds is thereby checked, and also the everforming crust, which shuts out the air, is broken, and insects and vermin are destroyed. When the plants have six leaves, thinning or singling out should be begun. Frequent hoeing, subsequently, is also necessary to keep the land from becoming bound. When, in the month of July, the head of the roots show above ground, which heads are totally useless for sugar manufacture, their development must be checked by moulding-up, which operation also facilitates the getting up of the roots when ripe.

"6 Leaves are to a plant what lungs are to an animal; therefore nothing damages the beet root more than taking off the leaves before harvest. Such a senseless course reduces the crop one-half.

"7. Roots, which are to be kept for several weeks, or perhaps months, before being taken to the factory, should be quite ripe when gathered, should not have been exposed to frost, and should have been harvested in a fresh or moist condition. The roots are seldom ripe before the middle of October; yet frequent frosts occur at the beginning of November; the beet-root cultivator must, therefore, make haste to harvest his crop before the frost commences, and postpone all other work until the crop is secured. If a long drought has occurred, the grower should wait until a good rain has fallen, for roots which are harvested in dry weather and after a long drought will not keep.

"8. The raising of the roots is best performed by means of spades or shovels; forks are not suitable for this operation; for, from experiment, too many roots get pricked, and pricks are a certain cause of decay, whereas a smooth cut with a shovel is not so injurious. In any case, however, wounding of the roots must be most carefully guarded against.

"9. The leaves of the gathered roots should be cut

off with a sharp knife, close to the crown; also the under-leaves, which in most cases are decayed, must be removed by the hand or the knife, because they induce rottenness, and if left on are troublesome during the washing process.

"10. Roots which are to be conveyed to the factory within three or four days of gathering, should be plentifully covered with leaves, because the sun's rays beget decay of the roots, and rotten roots produce dark-colored juices, which are valueless. If the roots have to be taken to the factory later, they must be thoroughly well covered with earth, either in pits or in heaps, so as to protect them as well from the heat of the sun as from the frost, and thus prevent their losing quality or quantity. The beet-root cultivator should remember the well known German proverb, 'Out of the earth, into the earth;' *i. e.*, the earth not only produces but preserves.

"11. The pits or heaps should be three feet wide and one spit deep, and of any convenient length. The roots should be laid with the heads outwards. The work of covering up as well as the removal to the factory should be carefully performed, so as to avoid the bruising or wounding of the roots, as their soundness is of the utmost consequence. Heaps which are three feet wide should not be more than three feet high, so as to keep the roots cool and prevent their sprouting. The roots should be covered up *immediately* with at least two feet of earth, in order to avoid thoroughly the admission of air, for every change of temperature is injurious to the roots. Ventilation by straw chimneys, or other methods, must be most strictly avoided. If the heaps cannot be completed before night, a thick layer of leaves should be used as a temporary covering to prevent damage by night frosts.

"12. In carting the roots to the factory, great care must be taken against bruising or breaking off the tap-root (the tap-root is the richest in sugar), for roots handled roughly soon show black spots and quickly rot.

"13. That the foregoing rules are attended to properly, the inspector, appointed by the sugar factory, will satisfy himself, from time to time, by actual observation."

The advantages of this business to the manufacturers are sufficiently obvious from the above statements. The benefits to the farmer are, 1st. That the manufacturer will pay him $5 or $6 a ton for the beets and return the pulp, which is about one-fifth the weight of the beets, or say three tons an acre, and which for feeding cattle is worth about one-half as much per ton as good hay. 2nd. The manufacture is carried on in winter, and not in summer, and so furnishes winter employment for the same set of laborers that work on the farms in summer. 3rd. It supplies the stimulus and the rewards for improved tillage, at the homes of the farmers everywhere.

The common white beet, which is called a sugar-beet and which grows very much out of the ground, is not the kind that is raised for sugar making. The French Vilmorin beet is probably the richest, though the Silesian is preferred by many. The seeds cannot be distinguished from those of our common beets. They can probably be got at some of the large seed stores in New York and Philadelphia, and the Commissioner of Agriculture in Washington has a large stock which he is distributing to those who are willing to make a trial of their cultivation. Extensive trials are being made in the neighborhood of the Massachusetts Agricultural College at Amherst, this year, and those interested there have imported seed for that purpose.

It is hoped that farmers into whose hands this paper may come, will give the cultivation of beets a trial, and that our farmers' clubs, as well as our county and state Agricultural societies, will encourage this promising branch of agricultural industry by their official action.

GEORGE H. COOK,
N. J. State Agricultural College,
New Brunswick, N. J.

THE CHEESE TRADE FOR THE YEAR 1871.

(*Mark Lane Express*, January 8, 1872.)

The opening of the year 1871 was marked by a fair demand for the best descriptions of cheese, both American and English; prices ranging, for the finest factory cheese, from 72s to 76s; for really fine Cheshire, 80s. to 84s.; and for the very best Cheddar, 84s. to 88s.; while choice Cheshire lumps were saleable at 66s. to 72s. As the season advanced prices gradually declined, much of the stock of American cheese got stale, and strong in flavour; a considerable portion of the English cheese also deteriorated, and in the months of May and June large quantities of each were sold at prices between 28s. and 50s. Some of the American cheese had been several months before purchased on French account, but not being required was returned and re-sold in this market at a very great sacrifice. Early in June the finest old American cheese sold at 66s. to 68s., but about the middle of the month the importations of new produced an effect, as the best descriptions were offered at about 60s. It soon became demonstrated that both in America and in this country the make of cheese was abundant, but owing to moderate prices and the extensive employment which prevailed, a large consumption of cheese was promoted. The demand was for sometime confined to the best qualities, but as supplies of all kinds increased prices receded, so that late in August and during September, "States" factory cheese were sold at from 44s. to 54s. This led to a brisk trade, and many of the dealers thinking that prices were at the lowest purchased freely, giving a tone to the market and leading to an improvement in price, so that in October 60s. was obtained for the finest factory cheese, and for good and prime 52s. to 56s. From October to the end of the year the trade was dull, but owing to the comparative scarcity of the extra fine qualities in American cheese, a limited demand was found for these at 64s., and even 66s. was in some case realized. The close of the past year contrasts remarkably with that of 1870, prices being fully 10s. per cwt. lower. The reason of this may be referred to the fact, that in addition to a bountiful supply of English cheese, the importations from America have been in excess for the year 1871 of 303,783 boxes, as shown below.

	Boxes.
Importations of American cheese for the year 1871	1,386,661
Importations of American cheese for the year 1870	1,082,878
Excess in 1871	303,783

CORDEROY AND CO., Mill-lane, Tooley street
LONDON, *Jan.* 1, 1872.

THE ADVANCE IN WOOL.

(From the *Journal of Commerce*, New York, March 2, 1872.)

Just here, for the benefit of those who have not watched the wool market, we may add a word or two of in

terest to all connected with its growth and manufacture. When the manufacturers sent their buyers out to the West after the last clip, they instructed them to lay in domestic fleeces in good condition, upon a basis of 50 to 52 cents per pound for light Ohio fleeces, known as three-quarters to full blood. When the buying began these were considered inside rates, and the growers generally obtained 53 to 55, the later sales touching 57 to 60 cents. When the offerings had been picked up it was found that a very considerable portion of the clip had reached the hands of manufacturers, leaving but a moderate quantity for the operations of speculators. These last named gentry have been busy crowding up the market until the later quotations for actual sales are 80 to 85, and some fine lots are held at 90 to 92. If the heavy manufacturers had to buy at these prices, nothing could be worse for the wool growers. The staple made into goods at such rates could not be worked readily through the channels of consumption; the sale of goods would be materially checked by the exorbitant prices, and when the time came for another clip the growers would not obtain above 40 to 42; or, if this were not reached the first year, by the next the price would be down to 35, and the whole interest would be prostrate. Nothing could have occurred more favorably for the grower than the fact that the supply for the current year went so generally into the hands of manufacturers. The larger fabricants have made no material advance in their goods, and the supply will be sold off more readily, bearing a good demand and a strong market for the raw material after the next clipping. The imports of foreign wools have increased, although some of the statistics made from estimates have been wide of the mark. The following are the official figures, giving the entire imports in quantity and value at all of the ports of the United States in each of the three last fiscal years:

IMPORTS OF WOOL INTO THE UNITED STATES IN EACH OF THE LAST THREE FISCAL YEARS.

	1869.	1870.	1871.
Pounds..........	39,275,926	49,230,199	68,058,028
Total value......	$5,600,958	$6,743,850	$9,780,443

The importation will be stimulated by the high prices now current. Indeed, this course is very satisfactory to the manufacturers. Having bought their own supplies at 50 to 60, they are quite content to see the small surplus on the market go up to 90 to 95, encouraging both the home product and the foreign purchases, and thus paving the way for a steady but not exorbitant market at the next clipping. The home products range doubtless from 130 to 160,000,000 pounds. California is making rapid strides in wool-growing. The yield from that State which was 2,378,250 pounds in 1859, reached 22,485,443 in 1871. The annual increase there is now about twenty per cent., and the quality and condition are improving.

Boston Wool Markets.

[From the *Boston Commercial Bulletin*, May 8.]

The Wool Market has ruled very quiet during the past week, and the sales foot up much smaller than last reported. In fact, with a stringent money market, a slack demand for goods, and declining prices for wool on the other side of the Atlantic, buyers are not disposed to operate beyond their immediate requirements. Such of them as are temporarily supplied are now holding off for developments in regard to the tariff and the probable cost of the new clip. Holders, on the other hand, are free sellers, and those of them who are receiving large invoices of foreign are disposed to make a little concession in order to realize promptly.

Prices have been gradually settling down, and must be quoted lower for nearly all descriptions. The decline from the highest point ranges from 7c. to 15c. per lb.—the greatest falling off being on pulled wools. But it is hardly probable that wool values will fall to a much lower range for the present, especially if the indications of a speedy easing off in the money market are realized, and gold continues to advance. Thus far this advance has been about offset by the prospect of ten percent reduction in the tariff rates.

But the stock is small, and a long time must yet elapse before the new domestic clip will be available for manufacturing purposes, as the shearing will be late, and with the present extreme views of growers the crop is not likely to be marketed in a hurry. Before that time shall arrive most manufacturers will be compelled to renew their stocks of raw material, and many of them will have to come in several times; thence we look for an active demand and a little reaction in prices before the close of the season.

In fact, as matters now stand, any considerable increase in the volume of trade would be likely to produce a great change in the tone of the market. Nothing apparently can prevent such a change but a general stoppage of woolen machinery, which is not likely to occur. Buyers will certainly make their appearance in strong force the moment they are convinced that the bottom has been reached; and, judging from present appearances, and the fact that this market still keeps below the general level of the commercial world, that point is not far off.

The receipts of new crop Australian wool are beginning to stock up, and the bulk of the supply intended for the American market is now at hand, and rapidly passing into consumption. The stock of choice South American wool is also being rapidly reduced. But other descriptions of foreign, including Cape, are beginning to accumulate and the demand is light.

Domestic pulled wools are also accumulating, with very limited sales for several weeks past. But prices for these have dropped to a point so near the views of buyers, that a renewed interest and inquiry have lately sprung up, and negotiations are now pending for several round lots which will probably be consummated during the coming week.

The transactions in domestic fleece have been mostly confined to odds and ends, and these mixed lots are being closed out at very accommodating prices. There are very few straight and desirable parcels left.

From California we learn that (as might have been expected) a break has occurred in the market, with prices lower and very unsettled, while Eastern buyers continue to hold off.

The latest dispatches from San Francisco do not confirm the previous report of a sharp decline in the California markets. Choice lots of Northern are still quoted at 52a53c., gold, but buyers are not operating freely.

Sales for the week foot up about 200,000 lbs. of domestic, and 400,000 lbs. of foreign. Included in the former are 5,000 lbs XX Michigan fleece at 80c.; 8,000 lbs. X do., at 75c.; 40,000 lbs. mixed Ohio and Virginia on private terms; 1,000 lbs. medium Western, 79c.; 18,000 lbs. Colorado, 48c.; 13,000 lbs. scoured, 95c a$1.12.

In domestic pulled, sales of 15,000 lbs. Eastern super at 80c.; 5,000 lbs. do., 75c.; 8,000 lbs. do., 80a85c.; 5,000 lbs. do., 75a85c.; 7,000 lbs. Western super and extra, 70a75c.; 1,000 lbs. extra, 70c.; 2,000 lbs. do., 80c.; 2,000 lbs. do., 80c.; 1,000 lbs. extra (short staple), 62½c.; 2,000 lbs. do., 72½c.; 5,000 lbs. super, 75c.

In California wool, sales of 1,000 lbs. old spring, inferior, 41c.; 6,000 lbs. fall and lambs', 38a42c.; 7,000 lbs. fall scoured, $1.10; 1,000 lbs. coarse Oregon, scoured, $1.08.

In foreign, sales of 28,000 lbs. Australian at 62½a65c.; 50,000 lbs. do., 60a65c.; 8,000 lbs. Montevideo, 55c.; 25,000 lbs. do., 50a52c.; 20,000 lbs. do., 47½c.; 4,000 lbs. do., 54a55c.; 64,000 lbs. do., on private terms; 62,000 lbs. do., on private terms; 5,000 lbs. Cape, 44c.; 12,000 lbs. do., 44½c.; 2,000 lbs. white East India, 68c.; 5,000 lbs. autumn Donskoi, 35c., gold; 45,000 lbs. Kalmuck (Russian), 21c.; 9,000 lbs. Mestiza wool skins, 36c.; 6,000 lbs. Cape, 45c.; 5,000 lbs. Australian, 63c.; 2,000 lbs. Montevideo pulled, 80c.; 12,000 lbs. Canada super pulled, 75c.

[From the *N. Y. Evening Express*, May 11.]

The action of the House of Representatives, on Tuesday, in reviewing the Tariff bill, and so reopening the way to a ten percent reduction on wool and woolens, has infused new hopes for the winter trade. The promised opening rates for the new clip of 70 to 75 cents, are relatively higher than the prices (80 to 85 cents) now asking on old lots. The last year's clip has shrunk over 15 percent, and will scour out now at a much less percentage of loss than will the new clip—hence, at the difference in quotations the old lots are preferable, but the amount of wool of this kind to be had is very small, and therefore the pretensions of speculators out West have some show of strength. We have previously shown why manufacturers are somewhat indifferent to wool at the present price. The news to-day from prominent buyers in California is "nothing doing." Wools are coming in burry and in poor condition. So far, Eastern buyers do not offer over 45 cents for choice, and some place 40 cents as a maximum; but as contractors have previously engaged wool at 40 cents, gold, for choice, business is at a stand. They have little confidence in the expected tariff relief, but there would be no question of the ultimate passage of the bill, and another lease of life to the hundreds of idle woolen spindles, if Congressmen should canvass our dry goods market for a single day.

UTILIZATION OF WATER FOR FARM WORK.

(*Farmer*, August 7, 1871.)

The *Banffshire Journal* gives an interesting account of the application of water power to farm machinery in the north, which might be adopted with advantage in other localities. Our contemporary says:

The farm of Pullo, situated in the parish of Meldrum, is about 300 acres in extent, and the steading is situated in an elevated position, a portion of the land having a gentle slope to the south. At the southern extremity of the farm there is a deep ravine, with a small stream running down the bottom of it. Mr. John Ross, the occupant of the farm, wished to supersede the use of horse-power in driving the machinery at the steading, and the stream we have referred to being the only available source of water, he set to work with the view of devising a plan of bringing its motive power to bear on the machinery. His labors resulted in the adoption of a system which, so far as could be ascertained, has no parallel in this country, the only approximation to it existing in Switzerland. The system is simply the erection of a water wheel at the side of the stream, and the carrying of the power to the machinery by means of wire ropes and pulleys. For the practical execution of the plan, Mr. Ross called in the services of Mr. William Dow, mill-wright, Claymires, Ellon, and he accomplished the work in the most successful and satisfactory manner.

The stream in the ravine, at the southern extremity of the farm, runs from west to east, and the water is collected in a large dam, from which it flows by a level run a distance of about 50 yards to the water wheel. The wheel is fixed on stone and lime foundations, built parallel with the bed of the stream. The overshot water wheel is 13 feet in diameter, and 3 feet 9 inches broad; and there is attached to the shaft an iron wheel 6 feet diameter, which gives motion to the whole gearing employed. The peculiarities of the situation necessitated the posture of the water wheel being from west to east, and there were some difficulties to overcome in setting the pulley for the wire rope to run in a direct line nearly from south to north. For this purpose three small shafts, with bevelled pinions and wheels, had to be employed, the third shaft bearing the pulley upon which the wire rope works.

From the bottom to the top of the ravine there is a nearly perpendicular height of 40 feet. At the top of the ravine there is erected a wooden frame as a support for the wires. The frame consists of a couple of strong upright posts fixed into the ground, strengthened at the base by a couple of cross beams, and having a beam resting on their tops. The height of the frame is 23 feet above the level of the ground. Into this frame is fitted a sliding case containing an axle and couple of pulleys, the axle being stationary, and the pulleys disconnected so as to run in opposite directions. From the top of the sliding case, chains run up the inside of the frame posts, cross the top of the posts upon a couple of pulleys, and hang on the outside with weights suspended to them. When the wire rope is carried across the pulleys in the outside case, the weights at the ends of the chains outside the frame posts are adjusted so that they pull up the case and tighten the wire rope. Thus, after the wire rope is fitted up, supposing it to stretch, or to be subjected to any unusual pressure, this self-acting apparatus would in the one case tighten up the slack, and in the other yield to the pressure and prevent breakage; and by means of it the rope is always kept at an equal tension. The weight necessary to effect this purpose is something less than the weight of the rope.

At about equal distances—say 80 yards apart—between this frame on the brink of the ravine and the threshing mill, there are two other frames for supporting the wire rope, and where it terminates in a circuit, and at the same time transmits the power to another circuit of rope, the last circuit of rope going directly into the barn and giving motion to the machinery. The two intermediate frames are composed of a couple of poles in the form of the letter A, their base resting loosely upon stones, and with a double-grooved pulley fixed between them at the top. These frames are about 18 feet in height. One circuit of ropes runs in one groove of the pulley, drawing the frame in one direction; while the other circuit of rope runs in the second groove of the pulley, drawing the frame in the opposite direction. Between these two opposing forces the frame is balanced, and yet moves to and fro to suit the tension of the rope on either side of it, and to allow the sliding case at the brink of the ravine to tighten or slacken the rope upon expansion or pressure at any point along the course of any of its circuits.

Over the distance of about 300 yards from the water wheel to the threshing mill, there are three circuits of rope. The first circuit runs from the pulley at the water wheel, over the two pulleys on the adjusting frame (one pulley having a forward and the other a backward motion), to the first support about 80 yards beyond, where it turns upon one of the grooves of the pulley. The second circuit extends between the two supports; and the third circuit from the second support to the top of the barn, above the threshing mill, where a pulley is fixed. In order to bring the power to bear on the proper line for the threshing mill, bevel-gearing was required within the barn. A cast-iron frame was made; the pulley bringing the power from without was fixed upon one end of the frame, and two small shafts were introduced, from one of which, by means of a belt, the power is communicated to the threshing mill. The frame has simply

the advantage of keeping the relative parts of the gear true to each other.

A good many experiments were made before determining upon the thickness of rope and size of the pulleys. The rope used is made of steel wire. In the centre there is a small hemp cord, covered by four strands, each strand consisting of six small wires. The rope is as nearly as possible a ½ inch in diameter, and, we may note, was supplied by Messrs. James Glover & Co., St. Helens. Preparatory to being used, it was coated with a mixture of tar and palm oil, the oil preventing the tar from clogging in the grooves of the pulleys. The wire rope is very flexible, but it was found that to obtain a minimum of friction and liability to breakage from the sharpness of the curve, a pulley of 3 to 4 feet diameter was requisite. The pulley adopted was 4 feet diameter, and it has been found to work without causing the slightest damage to the rope. The pulleys require to be turned, and are about the most expensive item in the undertaking—those used having been made by Messrs. Richard Walker and Brother, Bury. It has been ascertained in the present case that the power will be carried without any appreciable loss for a distance of over one mile by these ropes and pulleys. The ropes, however, must always be placed in a straight line; when any corner is to be turned, gearing must be erected to alter the direction of the motion, which can be done, of course, as in this case, by the use of bevel wheels.

The gearing embraces an agency for the letting off and on the water, and for the stoppage of the water wheel without interrupting the flow from the dam. From small cranks by the side of the threshing mill, a single wire is carried along the whole line to the water course, resting upon the top of the wooden supporting frames. By a turn of the crank in the barn, the sluice is lifted, and the water let off the dam just as easily as if one were working the crank at the sluice; and by a turn of another crank, a door in the water spout is let down, and the water has access to set the wheel in motion. When we saw the mill at work threshing oats, the outflow of water required to drive it at full speed did not half fill the wheel buckets. The whole gearing works noiselessly, and the vibration upon the running rope was on two of the sections imperceptible, and on the other for a few minutes after starting, only about two or three inches. As an indication of the speed acquired, we may mention that the drum of the threshing mill, which is three feet diameter, was going at the rate of 880 revolutions, equal to travelling 1140 yards in a minute. The pulleys run at half the speed of the drum of the threshing mill, so that the velocity is by no means excessive. The gear has been in use since April, and there is not the very slightest indication of wear on the rope.

The cost of the undertaking has, in this case, where the way had to be felt, and some special castings made, been greater than it would be were the work to be done with the experience now acquired. An estimate of the cost of the gearing need only be given, exclusive of the cost of the wheel and intermediate motions, which in each case would vary with the situation. The wire ropes and pulleys in this case cost at the rate of £10 per 100 yards.

Besides driving the threshing mill, the gearing has been connected with a corn bruiser and turnip cutter, and is regularly set to work when these machines are in use. Indeed, the gearing works so simply and satisfactorily that very little outlay beyond the mere cost of anchors, with pulleys and wire rope, would suffice for the application of the water power through it to the cultivation of the fields.

THE ULSTER MODEL FARM AND SCHOOL.

(*Mark Lane Express*, December 25, 1871.)

At the monthly meeting of the committee of the Northeast Agricultural Association of Ireland, Sir E. Coey, D. L., in the chair, Mr. Bingham, the Secretary, introduced Mr. Baldwin, of Glasnevin, Principal Inspector of Model Farms and Agricultural Schools under the Commissioners of National Education:

Mr. Baldwin said he attended on the invitation of the secretary, and with the sanction of the Commissioners, to afford the members every information they might require. After the committee having gone through a a good deal of business that day, he was unwilling to occupy their time. The committee, however, being unanimous in their desire to hear a statement by him (Mr. Baldwin) of the present position of the Model Farm system, he proceeded to remark that it afforded him very great pleasure to attend the meeting and confer with the members of that prosperous and most useful society. The system of agricultural education now in operation in this country under the direction of the Board of Education consisted of two distinct branches, which were to a great extent independent of each other, but which were capable of acting and reacting on each other most beneficially. Much confusion has arisen from not viewing these two branches each on its own merits The first branch consisted in blending, in ordinary rural National schools, instruction in the elements of agriculture with the ordinary course of literary education. The Commissioners have been pursuing this combined system of literary and agricultural education with varying success for upwards of thirty years. At first it was not well understood; but at last the efforts of the Commissioners were in a fair way of being crowned with success. The number of rural National schools in which agriculture is taught has been steadily increasing of late. In 1862, the number of boys who came within the influence of this species of instruction might be counted by hundreds. They are now more than ten times as many. The disposition of the gentry and clergy of all denominations is more strongly in favor of extending this branch of agricultural education, and the Commissioners were doing all in their power to meet the wants of the country. It was needless for him to dwell on the importance of this branch of education at a meeting of enlightened gentlemen such as he had the privilege of addressing. The present time was favourable for its extension. The farmers evinced an increasing desire to receive it. The Board aimed at affording sound elementary notions of modern agriculture. The knowledge thus imparted would give the tenant-farmers a new power of developing the resources of their farms. The extension of improved implements and machines rendered it an imperative duty to afford elementary knowledge of agricultural mechanism to rising labourers. He (Mr. Baldwin) ventured to invite the co-operation of the gentry and clergy, in developing the simple and inexpensive system of agricultural education, to which he had just referred. The second branch or grade of the Board's system of agricultural education was afforded in the model farms, to which the meeting wished that he (Mr. Baldwin) would, on this occasion, more particularly address himself. Of the model farms it may be said that their establishment was forced on the Commissioners. That is to say, the results convinced all classes that the state of agriculture which had previously prevailed should as far as possible be superseded by a new system; and many good and wise men advocated a system of Model Farms, as one of the means of accomplishing that object. The Commissioners yielded to the demands made upon them, and established some twenty of these farms throughout the country. It is not in his (Mr. Baldwin's) province to offer any opinion on the policy of the course pursued; but it is now his duty to state, for the information of the Society and of the public, that the Farms, as farms, are now, one with another, paying a satisfactory amount of profit, and exhibiting judicious modes of farming. The soil of the Belfast Farm is, unfortunately, very

stiff and plastic; but, after the application of capital and energy, it has at last been brought to a state in which it will henceforward pay. There is a splendid building on it, capable of accommodating a large number of boarders. There is a first-rate staff—a clever, sensible agriculturist, who manages the Farm, and affords systematic instruction to his pupils in the science and practice of agriculture. The literary instruction of the pupils is directed by one of the best masters in the empire who has also the charge of the general discipline. There is adequate assistance; so that at the school you have at present a staff competent to afford a sound, general literary, and agricultural education. They teach the elements of chemistry, of physics, and other branches relating to farming; and the general education includes land-surveying and mapping. The day is divided equally between practical agriculture, including out-door business, and the cultivation of the mind. The head is stored with general knowledge, and the head and hands are turned to skilled practices. With the view of placing this excellent general education, and special training in improved ideas and practices within the range of all classes, the fee for paying pupils is only £2 a-quarter, including board and education, the Commissioners contributing the additional amount required to provide suitable diet; and in order that young men of intelligence and promise, who evince a decided taste for farming, but whose parents or friends may find it inconvenient or impossible to pay £2 a-quarter, the Commissioners take in four pupils without any fee. These free places are given away by competitive examinations. An examination of candidates was recently announced. On the eve of the day named he (Mr. Baldwin) was called away elsewhere on urgent business. We shall hold an examination early in January, and be most happy to receive candidates nominated by members of this society. Of young men who seek admission to qualify themselves for farming, we do not require a high standard of proficiency. If they can read with intelligence, and write a fair hand, and do a little cyphering, we admit them. We require a higher standard from those who intend to become land-stewards, agriculturists, and agricultural teachers. They must be persons who, by their intelligence and aptitude for agricultural pursuits would, by promoting the public good, render the State an adequate return for the cost of their agricultural training. There is, as the society is aware, a central Agricultural Training Institution at Glasnevin, near Dublin, and to which the pupils who receive a preliminary agricultural training at the provincial agricultural schools are drafted from time to time At present the greater number of the pupils at Glasnevin are free, admission being obtained half-yearly by competitive examination. Well-educated persons from all parts of the country are allowed to compete; the most intelligent and promising are selected. It is competent for a boy who fails to obtain a free place, to become a pupil on paying a fee of £5 per quarter. Paying pupils are also admitted at all periods of the year. The society will expect me to state what becomes of these young men. Some go to farm for themselves or for their parents; a large number seek employment as stewards, agriculturists, and agricultural teachers. For a long time a very well-founded objection was raised to them by the landed gentry on the ground of youth and inexperience. We have endeavored to meet this objection by every means in our power. We send them out as working stewards to the large Model Farms, and, as opportunity offers, we send them as assistants to clever stewards and successful farmers. A young man enters the Belfast Farm, after his pupilage there he goes to Glasnevin, from Glasnevin he is sent as a working steward to the Model Farm at Kilkenny, Cork, or Athy. He often undergoes a four or five year's training before he is recommended to a country gentleman. This arrangement has worked admirably. The demand for our men is increasing, in proof of which this one fact may be mentioned, that while the course of training at Glasnevin is two years, we have not at present a pupil of eighteen months' standing; and I have at the present moment the nomination of nine persons to fill situations that require a good deal of agricultural knowledge, as well as intelligence and trustworthiness. Being anxious to render our pupils as useful as possible to the country and to themselves, we would solicit your co-operation in furtherance of our object. We think the landed gentry would consult their own interests by doing so. An admirable arrangement has been commenced by Lord Clancarty—a truly enlightened and zealous advocate of agricultural progress. He has been good enough to encourage his steward, Mr. Nesbitt, himself a Glasnevin man, to take six Glasnevin men as apprentice pupils to finish their agricultural training on the home farm at Garbally. He (Mr. Baldwin) found himself occupying the time of the meeting at greater length than he intended, or than, perhaps, he ought. All he would say in conclusion was that it appeared to him that no man who understood the state of Ireland could for a moment doubt the utility of such a system of agricultural training as he had explained.

The Chairman conveyed the thanks of the meeting to Mr. Baldwin, and it was agreed that the secretary, Mr. Bingham, should open a list of candidates for admission to the Ulster Model Farm and School at Belfast, and place upon it the names of the applicants recommended by members of the Association, and that from that list vacancies could be filled from time to time according as they occur.

THE FRAMLINGHAM FARMERS' CLUB.

The Double-Furrow Plough.

[From the *Mark Lane Express*, Feb. 5, 1872.]

At the last monthly meeting, Mr. Corrance, M. P., in the chair, Mr. J. E. Ransome introduced the subject of double-furrow ploughing in the following paper:

I propose this evening chiefly to confine my attention to the consideration of the questions: First, What are the advantages of double-furrow ploughs? Second, Can they be profitably employed on the majority of our farms? For there is no doubt that these are the points which directly interest the farmers of this country. In the first place, however, I think it will be interesting to inquire briefly into the history of double ploughs, to see how long ago they were invented, and how far they have been used prior to their revival in this country a few years ago. The first account of a double plough that I can find is in an old agricultural work (kindly lent me by Mr. Harland, Brimpton, near Scarborough), entitled "England's Improvement," by Captain Walter Blith, who wrote in the time of Cromwell. A drawing of this plough is given, and also directions for its construction. In form it is like two ordinary ploughs, with the beams strongly secured together, the handles of the front plough being cut off as well as the fore part of the beam of the hind plough. In his description he says the plough may be set to a working gauge, by means of a foot or wheel placed in the foremost beam, and that upon ordinary arable land, and also upon fair clean lay turf, a double proportion may be ploughed with it, and concludes by adding, "I for the present see not, but it may be of excellent use and expedition upon many lands in England." This plough must have been made more than 200 years ago. In another work, "Arthur Young's Tour to the North," published 1771,

a drawing is given of a double plough fitted with two wheels, then in use in the county of Worcestershire. The following is his account of it: "But a new invention is coming in very fast, which is the use of double ploughs, which, with only the addition of the horse, do double the work by turning two furrows at once. It is no gimcrackery business, but so solid and strong a machine that the common farmers approve it, and accordingly some hundreds of them are made." The plough was afterwards improved by Mr. Berney, of Bracon Ash, Norfolk, who attached to it the Norfolk wheel gallows, and, when worked against the Norfolk wheeled ploughs, it did with two horses three acres in the time they did two. See "Farmer's Tour through the East of England, vol. ii, p. 121." Towards the close of the last century, and beginning of this, improvements were made in the double ploughs. Lord Somerville appears to have devoted great attention and energy to this subject, so much so, that by many he has been considered the original inventor; but, although this is not the case, he, undoubtedly, greatly improved the plough, and did much towards its introduction. His plough, patented in 1802, had but one beam curved in the middle to adapt it to take the two ploughs. The mouldboards were made in two parts, and the tail end could be set out more or less to suit different sorts of work. A Leicestershire plough-wright, Mr. Handford, of Hathern, made the first adjustable double-plough about the same period. The beams in this could be set wider or narrower, by means of screw stays, to plough different widths. Mr. Billingsley, of Shepton Mallet, used one of these Leicester ploughs worked by oxen, and it is recorded that six oxen ploughed 385 acres with it, in addition to other work, within eleven months, and that they generally turned two and a half acres in eight hours. He says: "Some may doubt the possibility of making the double-plough so generally useful, but I can truly say I never yet found an instance where it could not be worked to advantage." To show what was actually accomplished at that early date with double-ploughs, I have extracted the following from an article on double-ploughs given in Rees's Encyclopædia. It is there stated that at a trial which took place on the Royal Farm at Windsor, 17½ acres of unstirred land were ploughed with four Devon oxen, one man and a boy in six days and a few hours, and that the oxen were in a better condition after the trial than at the beginning. This is close upon three acres a day, which you will allow was not bad work. In the same article mention is also made of a Mr. Tweed, of Sandon, Essex, who used the Somerville double plough, and who gives the following account of the work in a letter to his lordship, dated Sandon, 1802: "I take the liberty of stating the experiments I have made with your two-furrow plough on strong land. I put my first plough to work with three horses and one man, against two of my own and four horses, held by two remarkably good ploughmen, who are very much averse to any new implements. After exerting themselves to the utmost every day for a month upon clover lays, bean and peaetches, for wheat, they allowed, very much against their inclinations, that it performed the work best, which is entirely owing to the superior form of the breast, and the great advantage derived from the moveable plates. This trial having perfectly convinced me that there is an absolute saving of five shillings a day every day they are used, I ordered a second, and soon after a third, and have ever since had all my work done with them, which before employed six ploughs, twelve horses, and six men, causing a reduction of one-fourth the horses and one-third of the men, and it is in my opinion one of the greatest improvements that ever was made in agriculture, for which I conceive the public and myself highly indebted to your lordship." It will thus be seen that double ploughs, even at a very early date, were found to be thoroughly serviceable and economical implements. Various trials of double ploughs were conducted by the Bath and West of England Agricultural Society at the beginning of this century, and so thoroughly did they then consider it a standard implement, that it was engraved at the head of their printed forms, used when giving diplomas in connection with the Society. We have in our possession one of these diplomas, given to Mr. Robert Ransome, my grandfathor, in the year 1807, as an acknowledgment of the superior excellence of his new patent chilled cast-iron plough-shares. Since that time various improvements in the different parts of the plough have been introduced. Our own firm, upwards of 60 years ago, brought out a double plough, with wood beams, some of which have been in use to the present day. We have an entry in one of our old day-books of one supplied to the late Sir Wm. Middleton, of Shrubland Hall, dated February 12, 1818, "One new double plough. Repairing one old do." And they were worked on this estate for 40 years with two oxen to each plough, and doing their 1¾ acres a day. Subsequently this same plough was made entirely of iron. Later forms of double ploughs, in both iron and wood, have been made by ourselves and other manufacturers, and many thousands have been sold for use in this country and other parts of the world, though probably the greater number have been sent abroad.

How is it then, as it is clearly seen from the foregoing remarks, that double ploughs have been made in considerable numbers, and have done their work satisfactorily and well, that they have not came into much more general use in this country? The reasons are several: 1st. Because there was not the same urgent necessity for their use that there is now, and it was not sufficient to overcome the prejudice in favor of the established usage. As an example of this we may take the now almost universal "wheel" plough, which had a hard fight and a long one before it established its superiority over the old swing plough; and again, threshing and reaping machines were some time in replacing the flail and the sickle. There is no doubt that the difficulty of obtaining skilled labor had a great influence in bringing about all these changes, and the daily increasing scarcity of labor has been a most powerful stimulus during the past few years to the introduction of the double plough. 2d. Increased competition between this country and others in the produce of the soil makes it as necessary for the farmer as for the manufacturer to avail himself of any machine or implement which will lessen the cost of production. 3d. The old form of double ploughs was not so convenient and easy for the ploughman to manage as those lately introduced 4th. The old double ploughs did not draw so light as the new ones, especially on mixed and heavy soils, so that they were often too much work for three horses; consequently their use was confined almost entirely to light soils. When, however, the "Pirie" plough made its appearance in 1868, the time had come when farmers were well prepared to adopt any new implement that would help them in their labor department; and this, together with the fact that a considerable saving in draught was effected on many

soils by the new implement, by the application of the friction wheel and also the greater ease with which the plough could be turned at the headland, are the principal reasons, in my opinion, why the double plough has revived at the present time and acquired such a deserved and well-merited popularity. To come now to the double furrow plough of the present day, with all the improvements that have lately been made in it. To Mr. Thomas Pirie, Kinnundy, N. B., belongs the credit of bringing out the double plough in an entirely new form, and especially of fitting to it a friction wheel to run behind the plough in the angle of the furrow in place of the slade, in order to reduce the draught. For his invention he obtained a patent in July, 1867, but the plough was first brought to notice in this country at the Leicester meeting of the Royal Agricultural Society of England, 1868. From one cause or the other it did not figure very well at that meeting. It was not tried on the dynamometer, but one of his single ploughs, constructed on the same principle, was tried against the general purpose ploughs, and came out very heavy in draught. It had, however, been doing very well in Scotland, and Messrs. Fowler, of Leeds, took up its manufacture, and soon introduced a considerable number, having made several improvements in it, principally in the detail of its construction. The general form of the Pirie plough is so well known that I need not give you a detailed description; suffice it to say that it consists of two plough bodies carried on a wrought-iron frame work; this frame work is entirely supported on wheels, two of which run at an acute angle in the furrows, one in front, the other behind, and a third wheel runs a good distance on to the land, about midway between the other two, so that the plough is supported on three points at the corners of a triangle. The leading furrow wheel is steered by a handle leading to the back part of the plough, and handles are entirely dispensed with, but it is turned round at the headlands by depressing the land wheel and steering the leading furrow wheel.

I shall not attempt to describe the various patterns of double-furrow ploughs made by the English and Scotch makers—our own firm, Howard, Hornsby, Ball, Perkins, Pirie, Gray, Murray, Jack, Mitchell, and others, who have all been paying the greatest attention to the production of the best form of double ploughs. Some—and especially the Scotch makers—have more closely followed the general outlines of the Pirie plough; whilst most of the English makers—Messrs. Fowler excepted—have retained the handles and general form of the English double plough; but one and all have adopted the friction wheel for lightening the draught. The following are some of the chief points which should characterize a good double plough: 1st. It should not be heavier than is necessary for the land it is intended to work upon. 2d. It should be strong and simple in construction. 3d. It should have good clearance between the two plough bodies, to allow the second furrow to pass freely. 4th. It should have sufficient height under the beams to prevent any accumulation of rubbish. 5th. It should be so arranged that the width of the furrows can be easily altered. 6th. It should have a friction wheel to run at an angle in the furrow, to take the weight of the hind part of the plough, and the friction against the land side and sole caused by turning the furrow slice. This friction wheel should be adjustable in depth and width to adapt the plough to a hard or soft bottom, and a slade should be interchangeable with it for special places—such as stony ground. 7th. It should be arranged to lift out of work, and turn easily at the headland without cutting up the ground. 8th. It should have a pair of handles of sufficient length for the ploughman to guide it, and assist it round at the headland. 9th. It may be furnished with a steering lever if desired, but when the plough is furnished with sufficiently long handles I do not consider it necessary, and it adds to the weight and complication. 10th. It should be fitted with the best breasts, shares, coulters, and skim coulters, to enable it to do its work efficiently and without waste of power. These points we have endeavored to carry out in our double plough, but I especially wish to draw your attention to the principle, invented by my partner, Mr. Jefferies, which we have adopted for lifting and turning them at the headland. Instead of depressing and locking the leading wheels, we lift the plough bodily off the ground in the centre of its length. This principle is carried out by us by adding an extra wheel on the off-side of the plough, and this wheel (which is simply carried idle when the plough is in work) is, together with the land wheel, brought down to the ground on reaching the headland. The ploughman pulls a lever connected with these two wheels, which, with the onward motion of the horses, lifts the plough bodily on to these two wheels three inches above the ground. On these two wheels it rides round as easily as on a cart, and, being made wide apart, the plough cannot be upset.

We now come to the question of draught. Is a double-furrow plough lighter in draught, in proportion to the work it has to do, than a single plough? Or, in other words, can the same work be done with less power? This is, after all, the great point in connection with this subject; and without troubling you with all the figures and experiments which have led to my conclusions, I will endeavor to make clear to you the results at which, in my own mind, I have arrived. From the various dynamometrical experiments which I have made at various times on very different soils, and in various conditions as to moisture and drought, together with the reports of other draught trials, both public and private, I have come to the following conclusions: The comparisons are between ploughs exactly alike, so far as their breasts, shares and coulters are concerned, and taken at the same depth and width of furrow in each case. 1st. The old form of double-furrow ploughs, which had two slades, one on each plough body, took twice the power of a single plough fitted with slade.

(To be continued.)

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June 20

THE JOURNAL

OF

The New-York State Agricultural Society.

VOL. XXII.] ALBANY, MAY AND JUNE, 1872. [NOS. 5 & 6.

OFFICERS FOR 1872.

President — MILO INGALSBE, Sonth Hartford, Washington county.

VICE-PRESIDENTS.

1st district—JOHN D. WING, 74 Beaver st., New York.
2d district—EDWIN THORNE, Millbrook, Dutchess county.
3d district—DANIEL DONCASTER, Albany, Albany county.
4th district—FRANK D. CURTIS, Charlton, Saratoga county.
5th district—JAMES GEDDES, Fairmount, Onondaga county.
6th district—ALEXANDER S. DIVEN, Elmira, Chemung county.
7th district—BENJAMIN F. ANGEL, Geneseo, Livingston county.
8th district—WILLIAM H. PENDRY, Albion, Orleans county.

Corresponding Secretary—THOMAS L. HARISON, Morley, St. Lawrence county.
Recording Secretary—WILLIAM H. BOGART, Aurora, Cayuga county.
Treasurer—LUTHER H. TUCKER, Albany.
Executive Committee—ADIN THAYER, JR., Hoosick Falls; HARRIS LEWIS, Frankfort; ROBERT J. SWAN, Geneva; JOSEPH JULIAND, Bainbridge; JOHN L. COLE, Lyons; JAMES W. WADSWORTH, Geneseo; WHEELER H. BRISTOL, Owego; WILLIAM M. HOLMES, Greenwich.
Ex-Presidents—MARSENA R. PATRICK, THOMAS HALL FAILE, SAMUEL CAMPBELL, SOLON D. HUNGERFORD, RICHARD CHURCH.
Entomologist—ASA FITCH, M. D., Salem.
Chemist to the Society—CHARLES H. PORTER, M. D., Albany.
Mechanical and Consulting Engineer—HENRY WATERMAN, Hudson.
Consulting Veterinarian—Prof. JAMES LAW, M. R. V. C., Ithaca.

State Agricultural Rooms.

The Office of the Society is in the New Agricultural Hall corner of State and Lodge streets, Albany.

ANNUAL MEETING.

Pursuant to amendment of the constitution adopted at the Annual Meeting of 1872, the Annual Meeting will hereafter be held on the Wednesday succeeding the Third Tuesday of January in each year, at the City of Albany.

Annual Meeting of 1873, January 22d.

VOLUMES OF TRANSACTIONS WANTED.

The Transactions of the Society for the years 1841, 1842, 1846, 1847, 1848, 1852, 1857, 1858, 1859, 1860, 1861, are wanted, to complete sets, and members are requested to assist in obtaining them. Other volumes will be given in exchange, or payment made in money, if preferred.

THE THIRTY-SECOND ANNUAL FAIR

OF THE

New York State Agricultural Society

WILL BE HELD AT ELMIRA,

September 30 to October 4, 1872.

ENTRIES CLOSE AUGUST 31,

After which date, nothing except fruits and flowers can be entered either for exhibition or competition for prizes.

New-York State Agricultural Society.

EXECUTIVE MEETING, MAY 21, 1872.

The Executive Committee met, pursuant to adjournment, at the Agricultural Rooms, Albany, on Tuesday, May 21, 1872, at 4 o'clock P. M.

There were present the President, Vice Presidents Wing, Thorne, Doncaster, Curtis and Geddes, the Corresponding Secretary, the Treasurer, and Messrs. Thayer, Lewis, Swan, Cole, Bristol and Holmes of the Executive Committee.

Letters and excuses for non-attendance were received from Vice President Diven, Messrs. Juliand and Wadsworth of the Executive Committee, and Ex-Presidents Faile and Campbell.

C. H. Rowland, Esq., representing the Board of Supervisors of Chemung County, appeared before the Committee and verbally presented the proposition of the Board, viz.: to pay over to the Society the sum of fifty thousand dollars authorized to be raised by tax pursuant to chapter 212 of the Laws of 1872, such fund to be used by the Society for the purchase of land for a permanent Fair ground at the city of Elmira, and the erection of buildings thereon and improvement thereof; said land to be held by the Society upon condition that the State Fairs be held thereon at least once in three years for twelve years, and thereafter as often as at any other one place in the State, and that the County Agricultural Society of Chemung County may use said grounds for holding their annual fairs in the years the State Fair shall not be held thereon, the land to revert to the county whenever the Society discontinue the use of it as above provided.

Messrs. Armstrong and Van Duser of Elmira, accompanied Mr. Rowland, and joined with him in expressing the desire and expectation of the citizens of that place that the State Fair be held there this year upon the grounds to be purchased.

Messrs. Hutchinson, Johnson and Proctor appeared to represent the city of Utica and the new Driving Park and Agricultural Association organized at that city, and on behalf of the Association offered full compliance with the requirements of the Society as to grounds, buildings, forage, steam-power and shafting, for the Fair to be held upon the grounds of the Association.

They asked one or two concessions, which were regarded as reasonable by the members of the Committee informed thereof, under the circumstances.

Both delegations having retired, Vice President Wing offered the following resolution :

Resolved, That a committee be appointed to meet the committee of the Board of Supervisors of Chemung County, and that upon the recommendation of such committee of the Society, the President be and is hereby authorized and directed to make, sign and exchange an agreement on behalf of the Society, accepting the proposition of the said Board of Supervisors, and that the Fair this year be held at Elmira.

Mr. Lewis moved to amend the resolution by striking out the words " and that the Fair this year be held at Elmira," and inserting " and that the Fair be held at Utica this year, and at Elmira in 1873."

After debate, the question being put upon the amendment, it was decided in the negative.

The resolution was then adopted.

On motion of Vice President Geddes, it was ordered that in consideration of the time required for preparation of permanent grounds, the Fair be held September 30 to October 4, instead of September 16 to 20, as appointed at the last meeting.

On motion of Mr Swan, it was

Resolved, That the Committee on permanent location, viz.: the President, Vice Presidents Wing and Geddes, the Secretary, the Treasurer, and Ex-Presidents Faile and Church, be the committee under the resolution of Vice President Wing; that Mr. Bristol be added to the committee, and that at any meeting of such committee three members shall be a quorum.

On motion, Ex-President Gould and Mr. Isaac H. Cocks were appointed the Chemical Committee in place of Messrs. Samuel Thorne and John Haven, declined.

The Committee then took up the premium list and regulations and revised and amended the same, with the exception of the poultry list, which was referred to Vice President Curtis, the Secretary and Treasurer, to enlarge and perfect the same.

On motion, it was ordered that the committee under the resolution of Vice President Wing be a building committee, with full power to prepare and carry out plans for buildings, etc.

And on motion the Committee adjourned.

THE FRAMLINGHAM FARMERS' CLUB.

The Double-Furrow Plough.

(Continued from page 32.)

2nd. A double plough of which the back part of the front body is cut away, and which ha sonly one slade on the hind plough, does not take more than 1¾ times the draught of a single plough fitted with a slade. 3rd. A double plough of the new sort, with a friction wheel behind instead of a slade, does not take more than 1½ times the power of a single plough with slade. 4th. A single plough with a friction wheel takes about three-quarters of the power of a single plough with slade. 5th. A double plough, with a friction wheel, takes just double the power of a single plough with a friction wheel. On dry, hard land the above proportions do not hold good, and it is very doubtful if any advantage is gained on land in this condition by the use of the friction wheel. A slade then goes almost equally light, but when the land is wet there is considerable suction between the slade and the furrow bottom and land side, especially when the soil at all inclines to a heavy or sticky nature, whereas the friction wheel runs almost equally lightly on such land, the friction in this case coming on to the axle and nave of the wheel. It is important that the axle should be true and smooth and fit the nave well, and that all dirt should be excluded, in order to reduce the friction to a minimum, and for this reason we bore out the naves of our plough wheels and turn the axles, providing them also with an oil-hole, and exclude the dirt by a leather collar and steel plate at the back of the axle. On land with a rough stony bottom I have understood that the wheel is not so good as the slade, as it rises and falls over all the stones and inequalities, but I have not tried any experiment on such land. Taking the above figures to be correct, and the average draught, on a mixed soil, of a good single plough with slade when ploughing six or seven inches deep, being taken at 24 stone, we should have the draught of a single plough with friction wheel, 18 stone; double plough with friction wheel, 36 stone; double plough with one slade, 42 stone; double plough with two slades, 48 stone. Of course, these draughts will vary on different soils; and the advantage of the new double plough will be still greater when compared with many of the older patterns of single ploughs still in use, but it may safely be taken for granted that in almost all cases the double ploughs do not draw more than half as heavy again as the single ploughs, and the heavier and more sticky the soil the greater is the gain. The above statement is confirmed by the great trial of double ploughs held at Peterborough, October 4th and 5th, 1870, when the draught experiments were conducted by Mr. Amos, C. E., late consulting engineer to the Royal Agricultural Society of England. The proportion between the average draught of five double ploughs and the single plough of best construction was as 702 to 470, or half as heavy again. On the 15th November of last year another very careful experiment was carried out by the engineers to the Royal Agricultural Society of England, Messrs. Easton and Anderson, through one of their staff, Mr. Riche, at Caistor, the proportionate power to move 1lb of earth with a single plough was 14.9, against 10.6 with the double, showing a saving in draught in favor of the latter of 29 per cent. I could easily multiply proofs that there is as a great saving in draught, but I think I have said enough. Let us now look at the advantages to be gained by the use of double ploughs. 1st. Double Work: They will do twice as much work as a single plough in almost all cases. Sometimes, when the horses are not fully up to the mark, it may better do rather less than this, but even then a very largely increased amount is accomplished. 2nd. Saving in horse power: As we have seen, the draught is only half as much again; therefore, three horses harnessed abreast will do double the work of two on a single, and not be any harder worked. When three horses are used on a single plough on very heavy land, a four-horse team is sufficient for the double, but on very heavy work I should rather recommend two single friction wheel ploughs, worked by two horses each. On many light soils two horses are often employed on single ploughs, because one would hardly be sufficient, and in such cases the same two horses can readily manage the double plough, and not be distressed with the work. Many double ploughs are now being worked with two horses only on light lands. 3rd. Saving of labor: One man with a double can do the work of two men with single ploughs, as when three horses are required they are driven abreast and guided by reins. Working three horses abreast: In using three horses on a double plough, the most effective way is to yoke them abreast, two on the land and one in the furrow, as

their power is not only more economically employed, but one man is sufficient with the plough. In this case they should have compensating three-horse whippletrees, so that each horse may have its fair share of work. When preferred, two horses may be driven at length in the furrow and one on the land; but it is very objectionable to work three horses at length, as too much strain is thrown on the last horse on coming out at the headland. 4th. Work done better: The work can at all times be done equally as well as with a single plough, and it entirely prevents a man carrying a plough on its back, and so cutting an unlevel bottom, which can be done with a single plough even when fitted with flat cutting shares. As a rule, too, the furrows are more firmly closed and packed together, whilst the additional weight, and the very fact of having two plough bodies working together in the ground at one time, make the plough steadier and less liable to be thrown out of the ground by one of the bodies coming against a stone or other obstacle. 5th. Pan of furrow not so much trodden: As only one horse walks in the furrow, and two furrows are ploughed at one time, the horse walks in each alternate furrow, instead of everyone, and the pan is consequently less trodden down. 6th. Furrow bottom not glazed: By the use of the friction wheel, instead of the slade, all glazing, both of the bottom of the furrow and of the land side, is avoided, but they are left just as the share and coulter leave them, so that both air and water can get more freely into the soil, and a better bottom is left for the roots of the plants. 7th. Ploughing hill sides: In hillside ploughing they are very serviceable, as, by ploughing up and down the hill, two horses can carry two furrows down hill, and by slipping one furrow up hill, the two horses can take one furrow up hill; thus in each round ploughing three furrows against two furrows with the same team on a single plough. 8th. Subsoiling: They form one of the best implements for any ordinary subsoiling. By removing the front plough, and adding a subsoil tine to follow the furrow horse and subsoil the previous furrow, the hind plough turns a furrow over the loosened earth. In this way all treading of the horses on the subsoiled work is prevented, and generally three horses can plough and subsoil effectively to the depth of ten or twelve inches. 9th. Potato planting: They are very useful for potato planting. By setting the ploughs to the widest width, say twelve inches each furrow, or more if desired, the two carry twenty-four inches, and the potatoes are set in the furrow and covered the next round. This ensures the widths of the rows being exactly alike, and facilitates after operations. The boys who plant the sets have not to wait around, as they would have to do with a single plough. 10th. Paring stubbles: They are very useful for paring stubbles. The ploughs being set to their greatest width, and furnished with broad shares, twelve inches wide, the surface, to a breadth of twenty-four inches, may be pared at one time with a pair of horses. The greater weight of a double plough keeps it more steadily at the shallow depth of say two inches than is possible with a single plough. 11th. Beginning and finishing: The ridges, tops, or beginnings can be easily set with a double plough. By taking a small furrow with the front plough on the first half-bout and a full furrow with the hind plough which lies on the first furrow, then returning with two whole furrows to back up the top, three furrows are shown the first round against one with the single. The finishes can also be made, the only care necessary is to keep the ridges an equal width and the furrows parallel, so as to leave an even furrow at last. The best way to finish is to take the last or baulk furrow and the mould or brow up at the same time. If two solid furrows should be left at the finish it is as well to plough one off first, letting the front plough slip empty up the open furrow. In beginning and finishing with the double plough, it is a very great advantage to be able to set the hind plough lower than the front one, and in our ploughs we make the front plough body moveable up and down, so that their relative positions may be altered. Although, as I have said, the ridges and finishes can be easily and well done with a double plough, many prefer to keep one single plough going with two or three doubles, in order to set the ridges and make the finishes, and I think at first, at any rate, it is a very good plan, and I am not sure it is not always the best when several doubles are at work together. In order to make the most of the advantages to be gained by the use of double ploughs, it is very desirable to have the lands or stetches as wide as possible for although these ploughs may be worked, and are a great assistance, even where the lands are narrow, they are much more so when the distance between the ridges is sufficient to enable them to go a considerable number of rounds on each ridge. I have no doubt the adoption of these implements will tend to the practice of setting out a greater bulk of land in wider stetches than hitherto, and also to keeping them as level as possible, which is very desirable for the after operations of both reaping and mowing machines. 12th. All kinds of work: All kinds of work can be done with the double plough, with the exception, perhaps, of ridging or baulking up land for the winter. They will do ley ploughing for wheat, stubble, or autumn work, and cross ploughing, and may be worked at any reasonable depth. They can be fitted with all sorts and widths of shares, and with different forms of breasts or mould-boards, to suit different practices and requirements. 13th. Work done at proper time: One of the greatest advantages of double ploughs, besides the saving of labor and horse power, about which I propose to make some further remarks, is undoubtedly the great facility they give for getting the work done at the proper time. That a farmer should be able to get his stubbles broken up quickly in autumn, and his land prepared for sowing when the weather is favorable, is too well appreciated to need any remarks from me. As the double plough gets over a double quantity of work with an increase of only fifty per cent. of horse-power as compared with a single plough, the work with the same lot of horses is done much more speedily. Take the case of a farm where twelve horses go to plough with six men and six single ploughs, doing six acres a day. The same horses, worked three abreast on four double ploughs would do eight acres a day; consequently, in a week, they would do forty-eight acres, whereas the single ploughs would take eight days to do forty-eight acres. The doubles, therefore, do any given amount of work with the same horses in three-fourths of the time, and, in the above instance, two men would be spared for other work, and, the ploughing being finished sooner, the men and horses would be sooner ready to undertake any other work that might be required on the farm. 14th. Extra time and facility for other operations: As the double plough enables a farmer to get his ploughing done quicker, it greatly helps him in getting on with other work on the farm which would otherwise have to be delayed. This is one of the greatest advantages gained by the introduction of these implements, and one which every farmer will appreciate. 15th. Money saving: On the

other hand, and especially on those farms where the staff of men and horses kept has been sufficient to do all the work at the right time, and in a proper manner, a considerable saving in expenditure can be effected by the use of double ploughs. To show this more clearly, I will first take the case of a farm having three hundred acres of arable land, and on which, as a fair average, twelve horses are kept. Assuming, and in some cases I believe the assumption is correct, that no larger number of horses need be kept than are sufficient to do the ploughing, the following calculation would hold good: Six men and twelve horses would be required on such a farm to work six single ploughs, whereas three men and nine horses would work three double ploughs, thus saving three men and three horses. The horses might be entirely dispensed with by careful management, and the men during the time they would have been engaged in using the single plough. These three hundred acres of wheat, clover, peas, beans, barley, oats, summer land or root crops, would take at least two ploughing each per acre on an average, or say six hundred acres of ploughing. Taking one acre per day as the work of each single plough, or two acres per day as that of each double plough, the ploughing would occupy seventeen weeks. The following calculation will show the saving effected: Interest on the value of three horses at £30—£90 at 5 per cent, £4 10s.; annual decrease in value, at £2 each, £6; hazard of loss at £5 per cent, £4 10s.; annual value of food, three horses at 12s. a week, £93 12s.; shoeing and farriery at £1 each, £3; wages of three men for seventeen weeks at 10s., £25 10s.; total, £137 2s.; deduct interest on value of three double ploughs at £10, at 5 per cent, £1 10s.; total, £135 12s. Say a net annual saving of £135, which is equal to 9s. per acre on the whole farm. This may perhaps be an extreme case, or at any rate not the most usual way in which the saving effected by double ploughs would be taken, though I shall give you presently one or two statements from practical men corroborative of the above calculation. If two horses out of the twelve could be dispensed with, it would save £100 a year, or 6s. 8d. per acre. If only one horse out of twelve could be sold, the saving would be £60 a year, or 4s. an acre. And if no horses are sold, we still have the item of wages £25 10s., which is saved, or equal to 1s. 8d. an acre. On some light land farms where a great deal of the work will be done with two horses on a double plough, I believe quite the above saving may be effected

Three-furrow ploughs: Indeed, on such farms there is no reason why three-furrow ploughs should not be used, drawn by three horses, or even four furrow ploughs, but one objection to these is the wide headlands they make from one plough having to be fixed behind the other. Three-furrow ploughs have been made many years ago. I found a most interesting account and drawing of a three-furrowed plough invented by the Rev. Edmund Cartwright, of Woburn, Bedfordshire, in the year 1804, which was regularly worked on light land with two horses and one man. If this could be accomplished then, why not in the present day with all our modern improvements, and means for lightening draught?

In support of my statement that a considerable number of horses could often be dispensed with, I will give you an extract from some remarks made by Mr. Stein at a late meeting of the East Lothian Society. Referring to the saving from the use of double ploughs, Mr. Stein said: "He had reduced his stock from 4½ to 3½ pairs of horses (9 to 7), and he could quite as easily accomplish his work. He worked the plough with two horses in seed furrow, and three horses in stubble. He could work also on stubble with two horses, but he did not think it was economical to do so. With two horses he could turn over two English acres of seed land per day. On stubble land the horses did not go so fast." At a meeting of the Haddington Farmers' Club reported in the *Farmer* of December 25, 1871, Mr. James Wyllie read a most able paper on the double plough, and said: "On an ordinary sized farm the saving effected by them must be very considerable, and I have no doubt that in some cases from their use a pair of horses might be altogether dispensed with, in which case a direct saving of about £100 a year would be at once effected." At the discussion which followed, Mr. Smith, of Stevenson Mains, said since introducing this implement he had reduced the number of his horses and now worked 350 Scotch acres (which are equal to 444 English acres) with four and a half pairs of horses. Another gentleman calculated the saving at 5s. a day for every double plough he used. That I might be able to speak with some degree of certainty of the practical use of double ploughs as they had really been proved in work, I addressed a series of questions to gentlemen in various parts of the country who had bought double-furrow ploughs from us, and I am glad to take this opportunity of thanking those gentlemen publicly for the very kind and courteous manner in which they acceded to my request, and I feel that they have helped me in bringing this paper before you to-night, and think also that, through the medium of your Club, it will not be without its effect on many who may have hesitated at present to avail themselves of the advantages of double ploughs. I cannot pretend to give you anything like a summary of these reports, which are almost all of the most favorable character, and in the few instances where double ploughs have not proved successful, it has either been from a plough being sent which was not suitable to the land, or one of the earliest patterns, which were not so easy to manage as those we have more recently improved. They come from over 100 English farmers residing in thirty different counties, from several in Wales, and a not inconsiderable number (14) from Ireland. However, I will give you a short summary, and will lay the whole of the reports I have received on the table for any gentleman to look over, and also a book containing an analysis of the answers from each one. The reports in answer to the question, "How have you got on with your double plough?" are—"Well." "Very well." "First-rate." "Exceeded my expectations." "Perfectly satisfied." "Could not do without it," and so on. Quantity of work done, "generally double." Number of horses required: In answer to the question, "How many horses do you use on your double, and how many on your single ploughs?" there are 107 replies—

1 uses	2	horses on double to	1	on single.
8 use	2	do	2	do
77 use	3	do	2	do
1 uses	3	do	3 and 2	do
6 use	3 and 2	do	2	do
2 use	4	do	2	do
1 uses	4 and 3	do	3 and 2	do
1 uses	5	do	3	do
1 uses	5	do	4	do
1 uses	5 and 4	do	3	do
1 uses	6 and 5	do	4 and 3	do

Soil: Out of 111 replies as to nature of soil, 23 are heavy land; 10 are heavy and mixed; 27 are mixed; 11 are mixed and light; 18 are light; 4 are fen land; 1

is stony and rocky, and 17 are all kinds of soils. Parting with horses: In answer to the question, "Will the use of double ploughs enable you to part with any horses?" Out of 116 reports, 58 say they will be able to part with one or more horses; 24 do not say what proportion; 9 can part with one out of four; 8 can part with one out of five; 6 can part with one out of six; 1 can part with one out of seven; 5 can part with one out of eight; 1 can part with one out of ten; 1 can part with one out of eleven; 1 can part with two out of four; 1 can part with two out of six; 1 can part with two out of nine. Proportion of work done with doubles: In answer to the question, "What proportion of work can you do with the double plough?" the answers vary from "half to three-quarters," "nearly all," and "all." Difficulty or not with doubles: To the question "Have your men found any difficulty with the doubles?" the answers are, "Very little or none."

And now to those who may hereafter make trial of double-furrow ploughs, let me say -Don't be disheartened if the work is not so well done at first as you could wish. A little time, thought and patience will soon enable you to conquer the little difficulties that will at first arise, but which you will find only small difficulties after all. The two furrows must be carefully watched to see that they are equal in breadth and depth, and this point well attended to will be half the battle in producing good work with any well made double plough. There is one short extract from the work of Walter Blith, already referred to, which I feel I must give here as too good to be lost, on "The Best Way for the Tryall of a New Plough." "And, secondly, having his plough and all its accoutrements compleated, then to the tryall of it, and therein be sure to make the first tryall of your plough upon land, workable and regular lands, not upon lands above measure hard, rooty, rushey, twitchey, or any way infeasible, because upon such lands a true demonstration of the goodness and truth of the plough cannot be discovered, nor any rule can be observed. Because such lands will more easily and suddenly wrench, writh, or put a new plough out of its work before it be wrought into its work; a rough, new plough being somewhat like an unbroken horse, which may easily be spoyled in the hand of a violent madcap rider, but if the horse be kindly used, and taken off his untamedness by degrees, by ease, kindness and patience, he is made a horse forever; so after that, in ordinary land, your patient, discreet ploughman have well scoured your plough, brought it to a true furrow both for bredth and depth, and set your irons so it will go itself with the very bearing of the hand to keep it steady, then you may afterward be bold to put it to any service on any lands whatsoever the strength of it will abide, and it may be serviceable for many years." And to the ploughman he says: "I shall dismiss my ploughman with this exhortment—be as willing to learn as thou hast need, and abandon those poor, silly shifts men make to preserve themselves ignorant and unserviceable, as they have been ploughmen all their days, and are not now to learn; and men may as well be too precise, and better ploughs cannot be made than their country affords, and could better have been devised they would long since; with hundreds more so childish as are not worth an answer; but these exceedingly stifle and choke invention." I am afraid I have wearied you with so lengthy a paper; but I must not sit down without thanking you for having invited me to bring this subject before your Club, which I have had great pleasure in doing. Our firm has long been known in the manufacture and improvement of the plough (now nearly ninety years), and I, personally, have had much to do with the working and improvement of the plough for the last ten or twelve years, so that, beyond a matter of business, anything relating to the plough is a matter of interest to me.

Mr. Goodwyn said the difficulty he saw with regard to the introduction of the double-furrow plough was the question whether it could be used on heavy land as it could be on light or mixed soil. There was no doubt it would be a great boon to the light and mixed soil farmers; but he had considerable doubt whether in this heavy land district they would be able to use it more than at certain seasons of the year. On the average of years he questioned whether in their district two breasts following each other so closely could do the work satisfactorily. If the double plough could be used only for a part of the year, it was questionable whether the saving of horse labour could be effected. The implement would be very valuable after harvest for stubble breaking, and probably it would be available for seed ploughing; but how would it be for ploughing beet land when soaked with water? He should be very glad if it would answer all the year round, and all would be glad to embrace such a system; but there must be great hesitation before they reduced the number of their horses or men, unless they were certain that they could use it all through the year. If he was on a light-land farm he should not hesitate to go in for double ploughs, and discard the single plough; but in this heavy-land district there were times when it was difficult to get the single plough through.

Mr. Charles Capon said there was no difficulty in using the double ploughs from the breasts following too closely, there being plenty of width between them. The friction wheel was a great improvement on the slade, there being nothing for the earth to ball on. He had bought a double plough and had tried it, and did not doubt it was to be made to do all the year round. He confessed that he did not give his a fair trial, for he put it on a piece of beet land on a drizzly day, and the beet tops being very bad, they got round the wheels. The plough, however, did its work as well if not better than the single ploughs, and his man liked it.

Mr. Goodwyn said the double plough necessitated wider stetches, and this would require better drainage.

Mr. Capon said, whether the stetches were wide or narrow, the land wanted to be thoroughly drained.

Mr. Goodwyn said no doubt, but wide stetches required it more than narrow.

Mr. Robert Garrard said he had had a double plough of a Scotch make since Michaelmas, and it had worked uncommonly well. Three horses made two furrows with it more easily than two horses made one furrow.

Mr. Capon bore testimony to the ease with which Ransomes' double plough turned. It turned as easily as if in a cart.

Mr. Walton said fifteen years ago he saw a double plough, very much like the primitive one which Mr. Ransome had shown them in the old book, at work at Shotley. It was drawn by two cart-horses and a riding-horse, and was worked successfully for years.

Mr. Capon, in answer to Mr. Jeaffreson, said he thought he should set up another double-furrow plough.

Mr. Ransome, in answer to the President, said that the cost of ploughing by the double-plough system would be about 6s. 8d. per acre.

Mr. Capon said the single-plough system cost about 9s. an acre.

Mr. Ransome said that fallows might be very well

ploughed by the double-furrow plough if a deeper breast were used; it would be a good plan to keep breasts on purpose for such work. The breasts would not occupy much time in changing. The double-furrow ploughs could be used on any farm where three, or even where two horses were kept—in fact, where there was a plough used at all.

The President said they would find that Mr. Ransome had given them something that they could sympathize with when he told them that the introduction of machinery rested much on the scarcity of manual labour. Did they not see some signs that they were about to experience a scarcity of labour such as might lead them to try a new invention? He relied more upon the testimony of practical men in the information given to Mr. Ransome than upon the dynamometrical trials, because that information had been gained under different sets of conditions. He quoted Lord Western's saying that he would plough with racehorses if he could, to show that the speed gained by the double system was valuable. He would suggest a modification of the tires of the wheels to prevent clogging in bad weather.

Mr. Jeaffreson proposed and Mr. Garrard seconded a vote of thanks to Mr. Ransome.

CAUSE OF ABORTION IN COWS.

Paper read before the New York State Dairymen's Association, January 3, 1872, by M. Quinby, of St. Johnsville.

It is unnecessary for me to give all the conclusions of the commissioners that were appointed to investigate this malady. They are summed up as follows:

"14th. Abortion is a disease which is extremely local in character, and confined for the most part to particular farms.

"15th. The large majority of farms, even in the infected districts, are free from the disease, while upon a few farms the percentage of abortion is high, and the disease destructive in its effects.

"16th. Farms affected, and those unaffected, often lie in close proximity, with no marked difference in physical situation, or in the treatment which the cattle receive, to account for the difference in the prevalence of abortion."

They give no theory, and are unable to explain all the phenomena attending it. A great difficulty seems to be, to show why it should affect one farm, and the one adjoining be exempt. I propose to offer an explanation, showing why one is affected and the other not. I am aware that when a mystery has baffled the ingenuity of the whole community to solve, and that community has at the same time offered many theories, that are not accepted, it is very difficult to get even an examination of a new one. I hope, therefore, that you may have much patience, examine with candor, and judge without prejudice.

Seth Green says, in his work on trout culture: "We known that the semen of the male is full of animalculæ. These will live for ten or fifteen minutes. There is a hole for the reception of animalculæ in each egg. The egg always sinks into the water with the hole at the top. It receives one of these animalculæ only by this opening, and closes."

The study of animal physiology discloses enough similar to the above for our purpose of illustration. That is, nearly all fully developed, healthy male animals, of the higher orders, secrete incalculable numbers of animalculæ like the male fishes, which are retained in the body, till opportunity offers to deposit a part or all in the proper receptacle. Each or any one so deposited, with the favorable circumstances attending it, is capable of continuing life in a new being.

The greatest difference between fish and other animals seems to be in the fact that the female discharges her eggs, and they are afterward fecundated by the male. But, aside from this, I wish to show there is much analogy. When this fact in the natural history of fishes was understood, it was at once concluded by some thinkers, that if the female fish was taken at just the time she was about to discharge her eggs, and gently stripped, as in milking, her eggs would be expelled, and then if the male was manipulated in the same way, the eggs would be impregnated as effectually, and more certainly than when deposited by the parent fish. Success attended their effor s. When the Yankees got hold of this, they, in their haste, learned another fact, and that is, that the eggs must be fully developed, and that the milt of the male must also be fully mature.

Hon. Stephen Ainsworth, in speaking of artificial impregnation, says: "On the other hand, it must be just as clear to every one, that if the spawn are taken artificially, before they are mature, before the albumen is perfectly elaborated, etc., it must be more or less liable to die the first month it commences to feed, from its naturally weak condition." "The longer time the spawn are taken before they are ripe, the less in number will impregnate and hatch, and the more of those that do hatch, will die in spite of all the most skillful grower can do for them. * * * If taken so immature that only 30 per cent. can be hatched, they will nearly all die within 30 days after they begin to feed, certainly if strong feed be given them." Mr. Ainsworth seems to have no difficulty to account for the failure of the undeveloped fish. We ought not to have any, with the calves.

The failure of these fish, in this stage of development affords cases similar to the abortion in the cows, and to the same cause I would attribute nine cases in every ten, viz: unripe, immature, imperfect development of the animalculæ, *when deposited* in the proper receptacle.

Now, whatever theory we adopt, relative to the formation of these life germs, we must admit that there is a time when their existence has just commenced. That, however small when mature, they do not spring into perfect maturity at once, that they have a beginning, progress and mature, and if they are discharged from the male before they do mature, they either fail to impregnate at all, or do it with the life germ so feeble from the immaturity, that it cannot live to develop an independent healthy being. Among all the animals, there seems to be no one more liable to exhaust his supply of mature animalculæ than the bull in our large dairies, as they are generally managed. However rapid the production and accumulation of these germs, they must occasionally exhaust the whole. No animal seems more disposed to effectually do so than the bull. When every particle of mature secretions is discharged, and another temptation is presented, there is no hesitation with him; these organs are called on for a supply of fluid, immature as it must be necessarily. This state of things in some dairies is repeated continually for weeks together. The muscles of the body are strengthened by proper use, but when overtaxed, destroyed. On the same principle the male organs being continually stimulated to undue action, do not retain the semen to mature, and the secretions cannot be healthy. With some, virility is

entirely destroyed, as in case of young animals. Half developed, half formed animalculæ only are produced, and when this excess is repeated till enfeebled action is fully established, we must expect abortion as the result of such enfeebled secretions. It does not appear to have been thought possible, that as long as we could get it mature enough to produce conception, even though it was an abortion, it could be anything less than perfect. The considering all material healthy and perfect, that will, or does impregnate, is at the foundation of much erroneous theorizing. The commissioners seem to take this view. See report for 1869: "Your commissioner desires to be understood in this question; he does not, in either report, assert or intend to imply, that the age of the bull is likely to influence, in one way or another, the probability of a cow once impregnated carrying her calf to term; the fœtus conceived by a young bull would be just as likely to live as that conceived by an older one; the ovum once having been impregnated by healthy material, is under care of the dam, to whom we must thereafter look for any stoppage in the natural process of gestation." The commissioners do not express a thought that it is possible, that unhealthy or undeveloped material can impregnate.

The germ might be somewhat developed, like the fish eggs, that live for a time, and yet fail half way. When the strong bull has rest, after even excess, for a few hours only, for some of these half-developed animalculæ to fully mature or ripen, the result would be the full-term calf. Occasionally he does get a few hours' rest, and occasionally some of the cows go the full term. When a young bull, or stallion, has been used to excess, and becomes sterile in consequence, it can be accounted for on this principle. Instead of retaining these germs—as they often are, for months after they are matured, as in animals never urged to excess—the habit of discharging them when immature, is fully established, and continued long after the stimulus has ceased to operate. The whole system becomes demoralized, and discharges are continuous and involuntary.

We find analogy in the vegetable kingdom in the seed. The germ of the tree, shrub or plant is enclosed in a coating of some kind, to retain and perfect it, till deposited in its proper receptacle, moist earth. The kernel of wheat, or grain of mustard, when perfected and ripened, is endowed with, and will retain the living principle for years, and when received by the universal mother, will absorb the nourishment necessary to develop into an independent being. But how is it with the unripe seed that has not yet matured vitality to live beyond a few weeks, after separation from the parent stem? It must die, although surrounded by congenial elements. The seeds that are separated when possessing only vitality sufficient for a short time, would sprout and wither like the animal seed half ripened, that thrives for a few weeks, only to perish.

In propagating plants, shrubs, or even trees, it is all important that they are sufficiently ripened to retain life till self-supporting. Nurserymen, in propagating some varieties of the grape, find it necessary to place the slips in certain conditions—bottom heat—for a time, to develop roots before the leaves; otherwise the slip dies in a few days or weeks after the leaves are expanded. The little rootlets are needed to supply the exhalations from the leaves. The unripe animal germ, or animalcule, may thrive for a time, but without the rootlets or absorbents sufficiently developed in the male receptacle to sustain it, it must fail. The cause of failure, whatever it is, operates only in districts where there are large dairies. In the greater part of Greene county, in this State, as in some other river counties, pressed-hay is sold extensively. No dairies of over a dozen cows are found. Abortions are never heard of. The bull is never taxed as where there are large dairies. Where large dairies are just established it does not show itself. Every bull is hardy, strong and fully developed. It takes time, and perhaps several generations, to breed animals with this weakness, producing such disastrous results. Let such exhaustive service be called for from a perfectly healthy and vigorous animal. Although the fœtus of all may be carried to the end of the term, the hardiness of the parent is not transmitted to all alike. It is conceded that qualities are transmitted to offspring; and nothing is more likely to follow than the condition of the parent at the time of serviec. Now, when the healthy condition is exhausted, and by continual irritation, fever is produced, and followed by a feeble state at the time, we must expect the calves of such getting to be more susceptible to such influences than those begotten in perfect health. Let dairymen keep such calves—begotten when weakened—because they are fine in form, and they have bulls already weak in points where the greatest strength and vigor is needed for what is required. The animal that inherits enfeebled constitution, consequently unhealthy, or that state susceptible of disease, will be likely to transmit to still greater extent this condition to his progeny. When several generations have been bred by this excessive exhaustion, we have constitutions of both sexes so weakened, that we ought not to expect anything to mature. It is much easier to exhaust and run down than to build up. We cannot build up strength and vigor readily by starting from an excessively weak point. As a remedy, then, I would recommend returning to first principles—this remedy recommends itself, it never has failed—get back to those involved in small dairies. Put restrictions on all excess. Procure a bull from a herd where there has been no excess for at least several generations previously, lest he inherit the weakness causing failure. Keep him excluded from the cows, not by shutting him in a dark, close, unhealthy cellar, but in the open air. Break him to the halter, and never let him serve with more than one leap per day, when daily service is likely to be required.

To show what is generally considered moderation, I will quote from the *Country Gentleman*, Nov. 9:

"*Use of Bulls.*—In answer to the inquiry of A. C. P., of Royal Oak, Mich., for the best success in breeding, it would be well not to let any bull serve more than thirty cows in sixty days, and unless very strong not more than twenty. Bulls vary much in vigor, and circumstances also vary. The services might be very unevenly demanded during the period named. Under proper management, a yearling bull will be considered, by most breeders, sufficient for a herd of twenty to thirty cows, and one two years old or over for a herd of sixty to a hundred, for the mere getting them with calf, but the calves will show it if the bull is overtaxed."

The way "the calves will show it," is not mentioned, it is presumed it is some sort of weakness. I would say if this two year old, should have been bred from this weakening process, and then serve in the usual way, one hundred cows in sixty days, that some of the calves would indeed "show it," in abortions of one month, six months, or even full term. Can not a

weakly, inferior specimen of full term, be called an abortion also? and are not some of the ten thousand *deacons* annually put out of the way, equally so? It is quite certain that more vitality would be expended in serving thirty cows in sixty days, in the usual excessive way than would be required to serve effectually one hundred as proposed. A dozen could be served, in what is often tak n for one.

Should the limits named be considered extreme, I will give the suggestions of Dr. Gray, of Utica, who is authority in such matters, and who patiently went over the whole subject, as here presented. Said he, "To convince the majority of the dairymen that you are correct, you must give them further test. From the manner you have explained it, some few will be satisfied that there is something in it worthy of further experiment. Let them procure a bull absolutely free from all suspicion of this weakness. Let him serve with one leap only, once a week, such cows as are in the habit of aborting." On my remarking that most dairymen would consider the limit unnecessarily strict, he said: "If you go into an experiment to test a thing, why not do it thoroughly, and have no half way work about it?" I am told that just this principle has been tried, and the results were the same. But every such case, when thoroughly scrutinized, has turned out not quite certain. It was not quite sure that the bull's immediate parent was not subjected to excess. Many times the management was entrusted to hired men or boys, who are apt to be more indulgent than the proprietor, and report having carried out his orders, when facts would be just the reverse. One man reported that his grade bull had been kept stabled; was quite sure that all excess had been carefully avoided, till some of the calves of the neighbors betrayed the sire by the very marks of nearly all his progeny; showing that while he thought his bull was accumulating strength and vigor, in quiet, his stable was opened, the bull use and returned, comparatively exhausted for his own purposes the next day. Any experiments instituted to test this theory, to be worth anything, must be guarded more strictly than this one.

Another dairyman had come into possession of a farm and dairy of 30 cows, where abortion had prevailed extensively for several years previous. A change was made in the bull—procuring a grade—and his services limited to one leap. Abortion ceased, and it has not been in the herd since. This comes nearer practicing the remedy than any case I have found; and yet it is not stated whether this restricted service was limited to one per day or otherwise. We want, as Dr. Gray says, reliable reports.

I am told, also, that it has sometimes prevailed for years in a yard, and ceased all at once, without any assignable cause. Now, by following out this theory, it is as easily accounted for as effects following causes the most plain. A change of bull is, first, most probable. If procured from abroad, from some healthy district, where all are vigorous alike, it is clear and we have another link in the chain of proof. If it was raised on the place, it would be supposed that the sire of such bull had an interval of rest sufficient to fully develop the germ from which he was conceived. Such resting spells must occur before the commencement of the season. Early spring calves are just the ones selected to raise, usually. Here we see the means why those that do it, are exempt, for a time at least, from this malady. Yet this is not reliable. Success is the result of chance. The first calf in spring may be brought forth a month in advance of time. Consequently, his existence might have commenced at the very weakest point in the parent, of the whole season. When such happens to be selected for stock, we must not expect to be exempted from consequences. Some near neighbors, with quite extensive dairies, have escaped for twenty years, and are afflicted for the first time, the present winter, with several cases. Have raised bulls, have bought them, and escaped by the chance system till now. Paid no regard to selections; allowing them to run at large with the cows, but generally had two bulls, where many others had but one. It must be evident to all, that even the limit of Dr. Gray greatly exceeds what nature designed. When the sexes are created equal, it is plain, if left in a state of nature, there would be no possibility, or even inclination, for one to take the place of hundreds. The wild bull of the prairie is quite a different animal from the pampered stall fed domestic. As different as the fair flower of the prairie is from its descendant, when man, by his stimulating appliances, has converted its simple stamens into beautiful corollas, depriving the seed germs of their fructifying influence; thereby aborting nature in her attempts to continue species by seed. This excessive amativeness is artificial. We have stimulated this propensity till we have found limits, as in the flower, beyond which nature will not go. After two centuries of culture of the potato had driven out most of the coarser and hardier varieties, and left the tender and delicate, it was found that further progress in the good qualities of this vegetable was vetoed. The life principle did not keep pace with other qualities. It failed, alarming the whole country. Fearing its extinction, Dr. Goodrich, that great benefactor, saw the necessity of returning to first principles and breeding from pure stock, procuring his male element at least from its native mountains in South America, for a cross with our cultivated varieties. His success—could he have lived to see results—would have surpassed his most sanguine expectations. It added millions to the wealth of the country. And yet, he did not gain perfection; it was only a vast improvement. He had only half of the original pure type to work with. In this example we have an important lesson, teaching us when we are beyond nature's sanction, to go back, if possible, to the point of the first deviation, and regain proportionately, as we go back, what we have lost, bearing in mind that this malady under discussion is never found, except when the cause here assigned is present, and absolute exemption from it, is only where the principles of the remedy suggested are fully carried out.

(From the *Mark Lane Express*, Dec. 25, 1871.)

SEWAGE UTILIZATION.

BY CUTHBERT W. JOHNSON, F.R.S.

The employment of sewage has become, at last, a question of even national importance. This has been promoted by the fact that there is an annually increasing demand for food far beyond the present power of the land of our islands to produce—this, as a natural consequence, leads to still greater demands for additional fertilizers; our countrymen, therefore, have become strongly impressed with the conviction that it is absurdly wasteful to allow the manure from many millions of bipeds to be poured into the sea, more especially since it constitutes a nuisance as it slowly streams towards the coast. In this case, however, as in many others, when John Bull wakes up, he has displayed considerable energy, but made also many mistakes by adopting schemes utterly incapable of

accomplishing what their authors proposed. Great misfortunes have, in fact, arisen from the general want of correct information as to the real composition of sewage. The knowledge of almost all persons on this head is derived from having witnessed the emptying of some cesspool, which commonly contains a black mass of putrefaction, bearing but a very small resemblance to the slightly discoloured stream issuing from a metropolitan sewer. It may aid us in our examination if we first inquire into the ordinary chemical composition of the sewage of London. and that of a country town such as Croydon. Here we are aided by the results of two analyzations made by Professor Way for the Commissioners of the Metropolitan Sewers, and of a series of examinations made by the chemists engaged by the Queen's Commissioners appointed to enquire into the pollution of our rivers. The metropolitan sewage examined was taken from 1, the Barrett's-court sewer; and 2, from the Dorset-square sewer. The soluble and insoluble contents of an imperial gallon of each were as follows (the weights being given in grains):

	I.	II.
Organic matter and salts of ammonia..	301.82	80.32
Sand and detritus of granite from the streets	20.69	45.28
Soluble silica	12.51	13.25
Phosphoric acid	10.44	4.17
Sulphuric acid	14.78	3.91
Carbonic acid	15.59	12.57
Lime	24.53	15.77
Magnesia	2.87	0.07
Peroxide of iron and alumina	6.20	2.66
Potash	14.13	3.32
Soda	1.51	....
Common salt	38.24	9.37
	492.26	209.70

The considerable difference in the solid contents of these two specimens will not escape the reader's attention. The large amount of potash in the sewage arises from the drainage of the granite-paved streets—one specimen of this street water was found by the Professor to contain in a gallon 82.76 grains of potash.

Having thus seen what are the ordinary contents of a metropolitan sewer, next let us inquire into the composition of that of a country parish. Here we have the valuable report of the Queen's Commissioners. Their labours, be it remarked. were not directed to bolster up any particular theory or to support any patent process, but simply to find the best mode of rendering sewage innoxious and useful. They examined on many occasions the sewage of Croydon, not only as it issues from the sewers, but after it had been passed over the sewage irrigated fields of Norwood and Beddington. They found in 100 parts of this sewage the following amount (in grains) of I. chemically-combined matters, and II. of mechanically-suspended matters. These being described in the following little table before irrigation as "head" and after irrigation as "tail" sewage.

THE NORWOOD SEWAGE.

February 25th, 1869, solid matters in solution:

Head	91.70
Tail	73.20

Matters in Suspension:

Head:	Mineral	3.68
"	Organic	6.86
Tail:	Mineral	0.00
"	Organic	0.00

Average composition in 100 parts of the Norwood sewage before irrigation and after it had been used in irrigation, September 28:

	Before.	After.
Total solid matters	94.9	81.7
Organic carbon	8.972	1.621
Organic Nitrogen	7.586	0.214
Ammonia	6.032	0.018
Nitrogen as nitrites and nitrates	7.000	0.848
Total combined nitrogen	6.554	1.068
Chlorine	8.66	9.73

"These results," remark the Commissioners, "extending over an entire year, show that the effluent sewage was, except in a few instances, so far cleansed even upon this heavy clay soil, as to be admissible into running water without nuisance."

The following results of analysis (as the Commissioners add) illustrate the effect of sewage irrigation when carried out upon the porous gravelly soil of the Beddington meadows by the Croydon Board of Health. The solid matters contained in 100 parts of the sewage December 28, 1869:

	Head.	Tail.
Solid matter in solution	48.0	52.8
Ammonia	2.684	0.265
Mechanically suspended matters	8.60	0.0

The average amount of nitrogen, as nitrates or nitrites, and ammonia left in the effluent sewage water of the Norwood and Beddington, varies slightly at different seasons of the year—it might, indeed, have been reasonably anticipated, that these compounds would be removed with greater avidity by vegetation in spring and summer than in autumn and winter. This is clearly seen, observe the Commissioners, by the following table which shows the amount (in grains) of nitrogen in these three forms, left in 100.000 parts of the effluent waters in each of the four seasons:

	Norwood.	Beddington.
Spring	0.892	0.284
Summer	1.026	1.422
Autumn	1 422	0.741
Winter	1.011	0.701

Of the general results obtained by sewage irrigation at Norwood and Croydon, it is more satisfactory to me to speak in the language of the Commissioners than in my own. They remark, when commenting upon the works of the Croydon Board of Health, that "the history of the facts connected with sewage irrigation at these places, has been sufficiently prolonged to make it now thoroughly trustworthy and instructive. At Norwood, about 60 acres of low-lying clay land, with sufficient slope for natural surface drainage, has been well laid out by Mr. Baldwin Latham, C.E. The drainage of about 4,000 people is received into a subsidence tank at the upper end, and thence flows along surface carriers arranged both nearly in contour and down the slope. The fall in these carriers varies from 1 in 100 to 1 in 1,000, and the water stopped at intervals in their course flows over the edges, and so finds its way over the surface of the land. Plots varying in size from one to three acres are irrigated at once, according to the abundance of the supply, which, especially in summer time, when it is most wanted, is barely sufficient for the irrigation of the land. Nevertheless, very good crops of Italian rye grass are cut five or six times a year, and a ready sale is obtained for the produce, at prices varying from 9d. to 1s. 3d. per rod, or £6 to £10 per acre, and the Croydon Board of Health have in this way obtained a revenue of £22 per acre during nine months of 1868, and £25 per acre in 1869, which, spread over the population to whose drainage it is due, amounts to about 3s. 9d. per head per annum." The power thus evinced by the grasses to remove the noxious matters of sewage will not escape the reader's attention. Of the mechanically suspended matters, both at Norwood and at Beddington, the whole appear to have been removed at the period of the examination

made by the Commissioners. The ammonia in the Norwood sewage was at the same time reduced from 6.032 to 0.013, and in the Beddington sewage from 2.684 to 0.265. These important results are well supported by a recent analysis of the sewage with which the Barking farm is irrigated. This analysis by Dr. Frankland was made in September of the present year. It is given in a very interesting recent report by Mr. H. J. Morgan (p. 19).

Dr. Frankland found in 100,000 parts of the sewage:

SUSPENDED MATTERS.

	Mineral.	Organic.	Total.
Head	5.24	5.60	10.84
Tail	few suspended parts.		

AMMONIA.

Head	5.450
Tail	.0.005

It was, in remarking upon the results of this analysis of the Romford sewage, that Dr. Frankland observed, "The raw sewage has nearly the same manure value as the average of samples which I have examined on former occasions. The effluent water is satisfactorily purified. The proportions of organic elements which it contains are far below those which have been proposed by the Rivers' Pollution Commission as the limits above which liquids should be deemed inadmissible into running water."

How far the marvellous power of a plant of grass to accomplish the purification of sewage exceeded that of any known chemical process may be seen by the results of the chemical examinations instituted by the Queen's Commissioners. In the following table of these results the words head and tail intend the composition of the sewage before and after the chemical process had been performed. In each case 100.000 parts of the sewage being examined

In the two Leicester processes:

By Lime Process.

	Head.	Tail.
Suspended matter	57.56	6.00
Ammonia	1.650	2.125

By Sillar's Process.

	Head.	Tail.
Suspended matter	57.56	6.12
Ammonia	1.650	2.0

Then there is another process tried at Stroud, which consists in the use of crude sulphate of alumina. This sewage, when examined by the Commissioners, after being thus treated, gave the following results:

	Head.	Tail.
Suspended matter	43.00	4.08
Ammonia	3.152	2.275

Then there is a process tried at Bradford, known as Nolden's. The sewage after this operation was also examined by the Commissioners, as by the following statement:

	Head.	Tail.
Suspended matter	51.00	.00
Ammonia	1.845	1.520

One other process has been adopted at Northampton—a mixture of chloride of iron and lime. The effect of these upon the sewage was as follows:

	Head.	Tail.
Suspended matter	83.12	0.96
Ammonia	6.00	5.00

The important conclusion to which the Commissioners arrived, after their long and laborious examinations, they thus state. "Every experiment which has hitherto been made goes to show that sewage can be most beneficially employed as a manure, and that it is thus also most perfectly cleansed. The drainage of more than 100 people can be purified sufficiently by its application to an acre of land. but it is certain that much valuable though non-polluting matter is still left in the sewage when it leaves the land, and that such effluent sewage might be applied again to crops in a similar manner with very great advantage and with additional benefit to the water itself." And they add, "No injury to health follows the adoption of this plan. No locality can be named in which typhus and enteric fever, dysentery, or other zymotic disease, generally attributable to foul emanations, has been traceable to irrigation with town sewage. On every ground, therefore, irrigation may be confidently recommended as a safe and trustworthy remedy for the nuisance with which towns have to deal."

Another mode of utilizing sewage, which is known as the earth system, has been very zealously advocated by the Rev. H. Moule, of Fordington. This has recently been well described by Mr. H. J. Little, of Thorpelands, in the recent number of the *Journal of the Royal Agricultural Society*. "It is probable that no other mode approaches it in its power of retaining the value of the solid parts of the excreta of a population. Why then has it met with so little favour? Because it is impracticable in any but small villages or isolated dwellings, and because the application of it in towns (if practicable) would still leave undisposed of a vast quantity of offensive matter which must be got rid of by means of water. It is not only the excreta of the population which find their way into town sewers, but a thousand sources of pollution, many of them at least as offensive as those with which the earth-closet would alone deal. It is a fact that the sewage of towns where the 'midden system' is adopted is nearly equal in value to those where the water-closet system is in use. The middens are cleaned out periodically by scavengers appointed for the purpose and on notice being given to the proper authority, the contents being carted away and sold for manure. This course would seem to prevent the possibility of the contamination of the sewage with any large proportion of fœcal matter; yet the experiments instituted by the Rivers Pollution Commissioners have placed it beyond a doubt that the sewage from these towns is to the full as offensive as, and nearly equal as a manure to that of the others. The reason seems to be that much of the soakage from the middens finds its way into the sewers and that more people generally contribute to the sewage in midden than in water-closet towns. It is evident that the earth-closet system can no more deal with what I may call the waif-and-stray elements of sewage than the midden, and for this reason it is found impracticable in towns"

I have stated thus much of the dry earth system, because its value in an agricultural point of view is considerable under some circumstances, and not because it is applicable in any way to the disposal of town sewage. With proper management it may no doubt be so adapted to the wants of private dwellings and small communities as to be a fertile source of increased production and of health. If the whole of our means are to be made the most of, Mr. Moule's system should find its way to general application in our hamlets, and the water system in our more populous villages and towns. The question of midden and water-closet sewage in towns has been thoroughly discussed by the Rivers Pollution Commissioners. They give the result of 37 analyses of the former, and of 54 of the latter, with the following result: midden sewage contained on the average 5.435 parts in 100,000 of ammonia against 6.703 in water-closet sewage. It also contained 6.451 of combined nitrogen against 7.728 in closet-sewage, but of chlorine the proportions were reversed,

and midden sewage was found to yield 11.54 to 10.66 parts in water-closet sewage. "It is, therefore, a fallacy," say they, "to suppose that by merely keeping solid excrement out of our rivers the sewage pollution of the latter is prevented. There exists a remarkable similarity of composition in the sewage of each description of town. The proportion of putrescible organic matter in solution in the sewage of midden towns is but slightly less than in water-closet towns, whilst the organic matter in suspension is somewhat greater in the former than the latter. For agricultural purposes 10 tons of water-closet sewage may be taken to be equal to about 12 of midden sewage. The retention of the solid excrements in the midden is not, therefore, attended with any considerable diminution in strength of the sewage, although its volume is somewhat reduced. *Neither is the case substantially different where earth-closets are substituted for middens;* for the sewage from Broadmoor Lunatic Asylum, in which these closets are partially used, exhibits no degree of exceptional weakness. It seems hopeless, therefore, to expect any substantial reduction of sewage pollution by dealing with solid excrementitious matters only."

Lastly, we have to consider the extent of land needed for the purification of the sewage of towns, varying as it ever does with the amount of water supplied to the inhabitants, and the storm and land water which find their way into the sewers. On this branch of our inquiry Mr. Little adds, "The quantity of land required for the disposal of all the sewage of a town should be a serious consideration, and the farmer will be wise to provide land according to the estimated increase of the population. He will, however, have very considerable difficulty in deciding at the present time upon the acreage of land which ought to be put under sewage. For the *purification* of the sewage has been hitherto far more studied than its utilization. This fertilizer, of which we are beginning at last to understand the true value, has hitherto been treated as waste, and much land has been occupied simply for the purposes of filtration. The capacity of the soil in this respect is well-nigh unlimited. The Rivers Pollution Commissioners give it as their opinion, that five acres of land, drained six feet deep and thoroughly well, will suffice for the purification of the sewage of 10,000 persons, if it be only divided into equal plots, each of which shall receive the sewage of six houses. The object of the sewage-farmer will be, of course, to spread it over the largest area compatible with remuneration; the prevention of waste and the extraction of nitrogen will be his chief cares. Hopeless, indeed, may he be of the realization of any pecuniary result should he select such a farm as Barking for his model. At that place, if Mr. Morgan's method of calculation be reliable, the sewage of no less than 335 persons was poured over every acre in 1870. The opinions of practical men now point, however, to 50 or 60 as the number of persons who can beneficially contribute to each acre. As a matter of fact, at least double that number yield ammonia to most of our sewage-farms. At Croydon 100, at Bedford 140, at Banbury 80, and at Aldershot 80 individuals thus contribute; but Mr. Hope, with the light of recent experience, descending from 50 to 40, from 40 to 30, and from 30 to 20, is now strongly of opinion that the latter number represents something like the normal proportion of human beings whose sewage should be disposed of per acre; and for this simple reason, that he is sanguine enough to believe that by proper management the whole of the nitrogen derived from such a number of persons can be restored through the soil, that only our present ignorance prevents our securing crops which will pay for such an application, and that vegetation is unable beneficially to appropriate a greater amount. With such differences of opinion, although enough land should at any rate be secured; and, for reasons which I shall presently enter into, I think the farmer should not estimate more than 40 or 50 persons to the acre, and possibly less than either of those numbers.

"The quantity of water supplied to the population will determine approximately the strength and amount of sewage on which he has to depend, assuming that the storm-water is excluded from the sewers, and that they do not receive land drainage to any extent. It is almost impossible for the farmer to deal satisfactorily with sewage which will be infinitely increased in quantity (at the same time that it is diluted in strength) when he least requires an addition in such a shape. Nevertheless so little attention has been paid to this important point, that at Bedford, where the supply of water to the inhibitants reaches but 150,000 gallons daily, the average quantity of sewage which reaches the pumping-station is no less than 600,000 gallons. At Warwick, the sewage amounts to double the quantity of water supplied to the population; and at Dover, with 1,000,000 gallons of water-supply, the discharge from the sewers amounts to 3,500,000 daily. Where each inhabitant is supplied with 30 gallons of water per diem, a total of 50 tons per head per annum will be available for sewerage purposes; and, as this is a fair and liberal, but at the same time not excessive supply, we may take it as a basis for our calculations on the subject. This quantity, where 50 persons contribute to each acre, will give a supply of 2,500 tons of sewage per acre per annum, equivalent to a vertical depth of 25 inches, which, in dry districts, will fully equal that of the rainfall; while taking 100 persons as contributors, no less than 5,000 tons of sewage, containing ammonia of the value of upwards of £40 per acre will have to be disposed of, and, I need hardly add, in a great degree wasted."

All our researches, then, lead to but one conclusion (and in this the Commissioners concur) that there is no available way of purifying the sewage of towns to be compared to that of the irrigation of land. It is thus, indeed, that we follow in Nature's steps, for it is to the vegetable world that has ever been assigned the assimilation of the decomposing matters of the tenants of the earth, and its waters, that would otherwise be destructive to animal life.

BOTLEY AND SOUTH HANTS FARMERS' CLUB.

[From the *Mark Lane Express*, Feb. 5, 1872.]

At the January meeting, at Botley, Mr. William Warner in the chair, the subject for discussion was "Root Cultivation, with reference to the best intervals or distances apart for various roots, so as to secure the heaviest acreage and the best quality."

Mr. James Withers said: I may first of all state that it was entirely owing to the prizes awarded for roots by this club and others of similar kind which first led me to think of and to afford me an opportunity of forming an opinion as to the right number of roots required to the rod to ensure the greatest acreage weight. And thus, by comparing one field with another, with their respective numbers of roots, and their weights during a course of years and through various seasons, it assisted me in coming to a conclusion as to the right number of roots per rod to make up the greatest weight per acre. This is evidently one of the best seasons for a plant of all kinds of roots we have had for many years past; and it was possible this season to secure any amount of plants to a given space of ground; in fact, I do not know a season when a good plant of all kinds was so easily obtained. And in taking a survey of the root crop while passing from field to field, and

from farm to farm, we might fairly expect to have seen one uniform system carried out with regard to the numbers of various roots, and the respective distances of those roots. This, however, is not the case, for great irregularity prevails throughout the whole district. This was occasioned by the hoe in thinning or setting out the plants. I do not, by these remarks, condemn the hoe for this purpose, but, as thinning is necessary, it is also necessary that we should know how far such thinning should be extended. It seems at first sight to be a subject of very little importance, but when we find that some tons per acre are entirely dependent on the right number of roots, it also being often in the power of the hoers to leave any stated quantity, it must be of some importance to know what that quantity should be, in order to produce the best possible crop. At all events, it seems at present a subject very imperfectly understood, or very badly attended to, as within the district of our root show facts prove that the number of swedes vary from 80 to 150 to the square rod, and mangold and other roots quite as much, and also that small or few numbers seldom gained prizes. We will, if you please, first of all fix our attention on the swede cultivation, it being, perhaps, the most valuable part of the root crop. At some early period of our club, say eighteen or twenty years ago, it was often remarked that the swedes drilled at 24 inches seldom gained prizes, their acreage weights being too small, while those with rows of 18 or 20 inches most frequently did so. Experience of late years has, however, proved to me that the reason was not simply because they were placed too wide from row to row, but because the plants were too thinly hoed in those rows, thus leaving about 80 or 90 roots to the rod, where at least 120 or 130 should have been. And as the 24-inch rows now most frequently take the first prizes it must, I think, show to us that the crop does not so much depend on the width of rows as on the right number of roots to the rod or acre; and it also goes to prove that the 24-inch rows have in past years been too thinly hoed, and if drilled wide between the rows the swedes should be left more thickly planted in those rows to make up the deficiency, or a loss in acreage weight will be the result. The greatest weight found by the judges amongst all the competing fields for prizes within 15 miles of Botley for the last year's root show for ten acres of swedes was a field of my own, which was drilled at 24 inches and 127 roots to the rod. The manure used was 3 cwt. of bone superphosphate, purchased of Mr. Spooner, and 60 bushels of ashes per acre. We sometimes, however, find that excess in numbers will produce a very fair crop; and we also find some cases where few numbers have done the same, and in comparing field with field we seem at times puzzled to ascertain which is right—whether the thin or the thick planting. And although both extremes have at times produced very fair crops, there is a probability that had the medium been adopted there would have been some tons to the acre more in both cases. And neither of the two is in my opinion right, it being better to avoid the two extremes, and follow that which has done the best through a course of years. I have, therefore, come to a conclusion as to the right number of roots, which, for early swedes, in my opinion, is from 120 to 130 roots to the square rod, and those of later sowing might be 140. The 24-inch rows, at 12 inches in the rows, would yield 136 roots to the rod, and each swede weighing the small weight of 2 lbs. only would yield 19 tons 8¼ cwt. per acre, or roots at 2½ lbs. each would be 24 tons 5 cwt., and it is but seldom that we produce that weight. With respect to the numbers of roots I have for the present in my own mind settled that part of the question; but as regards the right way of placing the roots—as to whether they should be 24 inches one way and 12 the other, or 18 inches each way (as both would yield the same number of roots) I am not so well prepared to give an opinion; but I am inclined to believe the latter would be likely to produce the greatest weight provided the horse-hoe could be used; but as 24 inches is the nearest to ensure good horse-hoe cultivation, and we cannot afford to sacrifice the use of that implement, I must as yet give the preference to the 24-inch rows. We will now leave the swede subject, and turn our attention to the mangold. The plant of mangold was, or should have been, a good one, but we find in it the same irregularity of planting, or even greater, than that of the swede, varying in numbers from 80 to 150 to the square rod, and, although the thin planting will produce very fine roots, which catch the eye and appear very beautiful when growing, yet I do not believe that the extra size or weight of such ever compensate for the deficiency in numbers, and, even if they do so, I believe that three roots of medium size would, if analyzed, be found to contain more nutriment than two of the same weight. Moderate thick planting renders the roots more shapely, and more easily cleansed and prepared for the cutter, and with much less waste, and the same would apply to swedes and other roots. And I believe that mangold should be grown in numbers very nearly approaching that of the swede. I, however, have not been so large a grower of this root as our chairman and a few other members of the Club, and cannot speak with so much positiveness on this part of the subject. I shoud recommend the rows at 24 inches and about 14 inches between the plants, or about 110 or 120 roots to the rod; but this root, like all others, should be regulated in numbers, according to the time of sowing—the late somewhat thicker than the early planting. The turnip plant for the early part of the season should, in my opinion, be about the same in number as the swede, or about 130 roots to the square rod. But as the sowing of turnips is extended over a long period, the right number of roots must depend very much on the time of sowing, taking care to increase the number as the season advances, varying from 130 to 200, or even more; and the stubble turnips, if hoed, should be from 260 to 300 to the rod, or at the least one to every square foot. I have more than once observed that where only part of a field of stubble, or any late turnips, have been hoed, those left unhoed have produced by far the greatest amount of sheep food, which was the effect of too thinly hoeing. Carrots, if drilled at 16-inch intervals, and from four to six inches between the plants, four inches would yield about 600 roots to the rod, and six inches would be about 400, and I believe 500 roots of carrots to the rod to be about the right number to produce the greatest bulk per acre in most cases. Cabbages and kohl rabi I will leave to others more experienced than myself. We find within 10 miles of Botley, the range of our root show for the last season, that the swedes vary in numbers from 79 to 156 roots to the rod, and that 127 was the heaviest of all, and 121 the next heaviest acreage weight. The mangolds vary in numbers from 77 to 151 roots to the square rod, and 89 and 151 were the heaviest. The carrots vary from 400 to 800 roots to the rod, and 575 proved the heaviest. Thus we find there is a very wide scope in practice with regard to the numbers of roots and the distances

of those roots: and as the few numbers, or thin hoeing, predominate, and seldom gain prizes, I believe that many or all us have more or less been guilty of too thinly hoeing for some years past, and this affords me a place to say a word or two on this part of the subject. The hoeing business has very much to do with the root crop irrespective of numbers and distances. The work of both horse and hand-hoe should be pushed forward as early as possible, and even in bad wet seasons it will not do to wait. Weeds will grow, and most in wet weather, and are much easier destroyed while in a state of infancy. Too much waiting for fine weather proved the bane of the swede crop in many cases last year which came under my notice; and many a field which promised well in their early stages became choked with weeds and stunted in the r after growth, and the hoeing business was also rendered much more expensive from the want of earlier attention. Leaving the largest plants is another thing worthy of our notice. The difference in two men's work in the same field is sometimes very striking; one of whom, leaving the largest plants while thinning or setting out, and the other, regardless of such, mo-e frequently leaving the small ones. This is another evil for which there is no after remedy. It is, therefore, evident that our practice with regard to numbers and distances embraces a very wide scope, and consequently affords a wide field for observation. I have very briefly introduced this subject, and have stated my views on it, and we as as men of business should be able at all times to give, if required, some reason for what we practice. That much depends on the right number of roots on the land to produce heavy crops I feel certain, and as there must be among all the various numbers which I have stated some right one, I hope that the members present will freely give us the benefit of their ideas on the subject, in order that we may come to some conclusion as to what that number should be to produce the best results.

Mr. J. Blundell said: Some people outside the Club had said, " Why the subject is very well understood; everyone knows what will be brought forward." Granting that was the fact, he must appeal to them whether, as members of that club, they would exclude the rising generation of young men, who were coming forward day after day as agriculturists, from a knowledge which some of those gentlemen claimed to possess. But they were living in an era when there was always something new to be learned, and that was why the subject under discussion was of immense importance. When he considered there were something like 400,000 occupying tenants, he computed that during the last twenty-one years they had had about 20,000 new farmers added to the number of agriculturists every year. Then, if this was the case, why should they wish to deprive these young men of the knowledge which they possessed twenty or twenty-five years ago by shutting out such a subject as the one that day from discussion? Therefore Mr. Withers was to be commended for having introduced it, and he was a man of practical experience, as he had been a judge for several years at their root shows, and in that position they could always learn something. They had a chance of comparing the roots grown, the various methods of cultivation adopted. and learn things which it was always difficult to get hold of without one had practical observation. Coming more closely to the subject, he thought the points they had to look to with regard to the root crop were the distance apart they should have them in order to secure the greatest weight and of most feeding value, and also the hardihood of the crops, in order that they might withstand the great changes of our fickle climate. The all-important point which they desired in the cultivation of root crops, and it was a difficult one, was to learn the number of roots they should save per rod to give them the advantages he had named. Another point was they had not hoers in the present day who would take such pains as those did who were formerly employed. This was a matter of immense importance. With animals so it was with the roots. If they wished to have good animals they would select the best, in order to produce a good stock, and it was just as necessary in the hoeing out of turnips that pains should be taken to leave the best and finest in the rows, so that they might be able to produce a better crop. Therefore it was of immense importance that they should have the right number per rod, and that they should also press on the labourers who hoed the turnips to leave the healthiest in the rows. One question was whether they might not manure the land too highly, and, although they could drive the roots up to 20 or 80 tons by these means, still they might be less capable of withstanding the changes of the climate than others which were not forced by an extra quantity of manure. Mr. Withers had very properly observed that some few years ago they were satisfied with twenty inches between the rows and about 108 to 110 roots to the rod. But if they took twenty inches between the rows he thought they lost the advantage of interculture. Therefore he thought that if twenty-four inches were allowed it would leave 120 or 180 roots per rod. With regard to the turnip crop he would, generally speaking, follow suit with the swedes, and he believed they would have them thick enough if they had the rows two feet apart. Then with reference to the mangold crop they found that the heaviest weighted ones were those which were grown at the greatest distance apart, but he believed the same argument he had used with regard to the swedes would hold good with the mangold. If they had the larger size mangold they would find that they grew very rooty and lanky, and it made it difficult to prepare them for the cutter. He thought if the roots were grown in greater numbers they would be of better quality, although not so large, and thus the same rule would apply to the mangold as the swede. And there was another question with regard to mangold. Some twenty years ago it was proposed to give a prize for mangold sown late, and it was decided that they should not sow until after the 6th of July. That for a number of years was adhered to. and with very great success. He remembered taking a prize with some which weighed twenty-six tons to the acre, and they were of very good quality. The question was whether they could not have a good crop by sowing late as well as early. He had been told by a gentleman in the neighbourhood that he had been feeding his sheep off mangold which had not been injured by the very severe frost we had at the latter part of the year. Thus it struck him very forcibly whether they could not grow mangold of sufficient hardihood to withstand the changes of the season. There was a system by which he thought they might be able to do this. With sugar-beet they had to cover up the roots in order to preserve them, and as it was well known that the part of the root which was under the ground was of more feeding value than that which was above it, he saw no reason why the mangolds should not be covered with earth. If they followed this and earthed them up he thought mangold might be left in the field with impunity to stand the chances of the winter. He did not say they could do the same with swedes, but the mangold had a far higher value. They knew very well if the swede was frozen in the bulb it lost in quality. He did not think the same rule would hold good with the mangold, and he thought if they were earthed up they might leave them in the land with comparative impunity. The

distance apart for the cultivation of cabbage was an important point. He thought they should allow a sufficient space between the rows to admit of interculture; for all sorts he should say two feet between the rows, while the smaller ones could be varied in the rows. They could be placed eighteen inches apart, and yet they would have a valuable crop. With regard to carrots they could grow them even if the soil was out of chalk. Then there was the distance, and a most important thing was to keep them clean, which was very expensive. He would take the same rule of two feet between the rows. He attached great importance to carrot cultivation, as he tried an experiment by excluding swedes on his farm for six years, and he grew carrots as the main food for his stock. And he would tell them that the earlier period for sowing them was wrong. He maintained that the 1st of May was the best time, and was much better than the last week in March or the first in April. And it was for this simple reason—that carrots would not vegetate and come forward unless the weather was sufficiently warm. Then, with reference to the number of roots per rod, Mr. Withers had spoken of 400 to 800. He remembered in Mr. Croskey's time, when he rented a farm of Mr. Gater, he not only had 900 roots per rod, but they were also of good average weight. Then came the question of cultivation, as they could not get the horse-hoe in between them, and then it also required a number of people to dig them up. He very well remembered that when he grew carrots his number generally used to be something like about 250, and then he had the advantage of interculture and a very heavy crop of large roots, while he did not have to throw away money by employing a lot of persons to dig them. He could not see a better plan than to grow them at wide intervals, and have about 250 roots per rod.

Mr. John Withers had had much practical experience on the subject, having been one of the judges, and he agreed with what his brother had stated in his paper.

Mr. James Warner had also been one of the judges at their root show, and had therefore some practical experience in the matter. He thought it was of immense importance that they should endeavour to secure, not only as last year but continually, a succession of good root crops, whereby they might secure to the kingdom a large and good supply of meat, for according to the quality of the roots so a in great measure would the price of mutton and beef range. Speaking more in connection with the subject, Mr. Warner said he agreed in a great measure with what Mr. Withers had adduced, as two feet apart would secure a better cultivation of the land, but for his own part he thought that swedes sown eighteen inches apart in the drills and twelve inches in the rows would produce greater weight than if grown two feet apart and thicker in the rows. However, it was quite requisite that a man should use his own judgment in the matter, and act for the best according to the circumstances in which he was placed.

Mr. W. B. Gater said he at first thought the subject had been worn very thin and was become almost threadbare, but since he had heard the able paper of Mr. Withers, and the practical remarks of Mr. Blundell, he could find that there was some advantage in having the matter again brought to their notice, and that much new light had been thrown upon it. Much depended on the careful eye of their labourers in hoeing, and with regard to the distance he thought the medium was to be preferred rather than the extreme of either the width or the closeness between the rows and the plants. There were cases when the cultivation should vary, but this was the exception rather than the rule.

Mr. Spooner said: With all due deference to the opinions expressed by those outside, he thought the question was a very practical and proper one to take up. His object in getting it brought forward was to see whether, by eliciting the opinions of those who were competent judges, they could not come to a conclusion on the extremely difficult point as to the proper number of roots per acre. It had been held that a smaller number should be left, but Mr. Withers was generally in favour of a larger, and he (Mr. Spooner) was never more struck with this idea than when he considered the large number of roots that were destroyed by means of the hoe. He could not give them a better illustration of this than by relating what took place with regard to some plants of his own. He had a small piece of swedes of about two acres, and he certainly never saw a finer lot of plants, there not being a single foot of the drills but what contained a swede. He therefore thought that they would agree that here there certainly should not have been any deficiency. But this was not so, however, and they were diminished by a large number by the manner in which they were hoed. In going round the field he began to count, and there were intervals of eighteen inches, and in a number of places two feet, without a single plant. Now, he knew how this came about, as he had gone over the field himself, and he could say that there was not an interval of six inches without a plant, and therefore it was self-evident that a large number had been destroyed by means of the broad hand hoe so generally used. Nothing could be more convincing than this. The men thought they had left plenty of roots no doubt, but there were only enough to give twenty tons per acre. The deficiency was quite seven or eight tons, and this was caused by the reckless hand hoeing. With regard to mangold he tried a piece with half a dressing of dung under ridges, with some artificial thrown over broadcast, and men were furnished with a stick fifteen inches long so that the seed might be dibbled in at that distance. In the ordinary state of things he anticipated that it would have produced something like 100 roots per rod, as they were planted at intervals of twenty-seven inches between the rows. After the hoeing there were but about 80 roots per rod, and about 33 tons per acre, but he thought the judges would agree with him that if the proper number of roots had been left in there would have been five or six tons more per acre.

Mr. John Withers: Quite as much as that.

Mr. Spooner: With regard to carrots he thought they ought to have four times the number of roots per rod as of mangold. He drilled in his carrots twice in a place. The rows were about a foot apart, and he believed produced upwards of 500 roots per rod, and 28 tons per acre. He thought hand weeding for carrots better than hoeing. At any rate his were not hoed. He believed about 110 roots of mangold per rod and about 450 of carrots would be something like a legitimate number. Of course there was an objection to placing carrots at close intervals, as there was the expense of weeding them and getting them up. He did not think, however, as much of the expense of weeding as of that of getting them up. He thought kohl rabi should be left thinner than swedes. He was talking last Saturday to a large root grower in Dorsetshire, and he was a strong advocate for having them thick. In Scotland he also observed that in very many fields the turnips were twenty-eight inches apart in the rows, yet there they grew quite as many roots per rod as in England, and he believed this accounted for their having such remarkably good roots, and especially swedes. He believed Mr. Withers was quite correct when he said that by having the roots thicker in the rows they could have a proper number per rod, and consequently a better weight per acre. He thought if more attention was paid to the cleaning of the crops and a more careful hoeing it would be very beneficial. Whether it would be better to employ women and

children in the first instance he would not say, but he believed it would be more desirable to have the plants hand weeded rather than that thousands of plants should be destroyed through the negligence of the labourers in their desire to earn a little more money. They found that the past season had been favourable for large roots, but that these did not come from the places where there was a large acreage—only from the spots where there were a few roots. They seldom came from where the acreage prizes were won. He might mention that last year they had as much rain in the three months which were so conductive to the growth of roots as they had in any other six months. The rainfall had been about thirty inches—about six inches in the other quarters, and twelve inches during the months of August, September, and October. The last two months particularly it was excessive. He did not mean to say but that the root crop might have been better with less rain, but it showed the importance that there should not be a long interval without rain. With reference to mangold he believed that the manure should not be close to the seed. but with the swede it was different. He believed the subject they had discussed was not only of interest to members of the Club, but it was also of importance to those who were outside and the community in general.

The Chairman thought the paper and the remarks which had followed it had shown that the subject was not so fully understood by all as it had been made out, and that when the roots had been left in the hands of the labourers it had often turned out unfortunate for them. The year before last he was very much dissatified with his root crops, and he determined not to allow his men to use the broad hoe. He sent into Southampton, and had some made varying from five to seven inches, and he made his men use them. He had gone into a calculation, and he found it would be much more desirable that the roots should be left thicker. Some rows were left eighteen inches and others two feet apart, with less intervals between the plants. Probably the roots left at eighteen inches would produce the heaviest crop, but a great deal depended upon the cultivation, and he thought, as being a fallow crop, there was an advantage in the two feet distance. By this they had the advantage of cultivating the soil and of keeping the crop clean. He quite agreed with Mr. Withers that the planting of mangolds and swedes the distance apart he had named would produce the heaviest crop and also the best quality. They all knew mangold was a very greedy feeder, and therefore if they gave them too much manure and space they would deteriorate; their object should be to distribute the manure so as to have not only an average weight of roots but also of good quality, as he thought that was the principal thing they desired with reference to the root crop. Mr. Blundell had alluded to the growing of mangold which should stand the winter. In sowing mangold to stand the winter they should take care that the plant should be able to retain its feeding qualities, and therefore they should be careful as to what manure they used.

Mr. James Withers having replied, the following resolution was submitted and agreed to unanimously: "That in the opinion of this meeting, in order to secure the heaviest acreage of roots and of good quality, it is desirable to leave a larger number of roots per rod than is usually considered sufficient; that swedes may be recommended to be grown two feet from row to row with intervals of 12 to 14 inches between the plants; that mangold may be grown two or three inches wider in the rows, and turnips somewhat closer, according to time of sowing, whilst carrots should be left about four times as thick as mangolds."

Votes of thanks to Mr. James Withers for his paper, and to the Chairman, were passed.

PRINCIPLES AFFECTING CULTIVATION, MANURING AND CROPPING.

The following is part of the report in *Bell's Weekly Messenger*, of the discussion which followed the reading of Mr. Mechi's paper on this subject, at the London Farmers' Club, May 6:

Mr. C. S. Read, M. P., said he desired to answer the last speaker in regard to the scientific and theoretical farmers when they came into a district. Mr. Smythies said they were pooh-poohed and put down, and were objects of scorn and derision. He (Mr. Read) thought it depended on how those scientific gentlemen comported themselves. (Hear, hear.) If they came, fancying that everybody was ignorant, and that they alone knew the secret of farming, and if they put forth their various nostrums, and said that they alone were right, then what Mr. Smythies had said might be true; but on the other hand, he (Mr. Read) would say that the majority of English farmers of the present day hailed with delight any gentleman who could come and teach them how to improve their agriculture, especially if they would do it practically, and not all from books and on theory. (Hear, hear.) Only last December the committee of the Farmers' Club received the melancholy news that their esteemed friend, Mr. Mechi was going to withdraw himself from the committee and club; and the club hesitated to receive the notice and asked Mr. Mechi to reconsider the matter; and the result was that to-night Mr. Mechi was quite himself again. (Hear, hear.) His natural force was by no means abated—(hear, hear)—he was always telling, and always amusing, and now he had gone beyond himself in scientific researches. (Laughter and "hear, hear") He (Mr. Read) did not wish to say anything against science. A good deal was said in favor of science, apparently to the disparagement of practice without science, but practice with science. (Hear, hear.) What had science taught the farmer that he did not know before? Could Professor Voelcker say what results chemistry had told the farmer that he did not know twenty years ago? He knew that science had explained the *causes*, and most interesting, entertaining, and profitable that explanation might be; but at the same time, had the farmer not known that the rotation of crops, even from the time of the classic writers, was necessary? Had they not known, before the days of Arthur Young, all the advantages of clay burning, which now seemed the newest hobby at Tiptree? Had they not known that oil cake manure was the best; rape dust, guano, and even the more modern introduction of what used to be known as saltpetre? However valuable they might regard science as an adjunct to the farmer, they must not suppose it did more than tell the farmer the causes of all the results which he had long ago made out by practice. (Hear, hear.) Referring to Mr. Mechi's observations as to the quantity of wheat imported, they must remember that economical reasons governed that, and that if wheat could be grown cheaper abroad than here, wheat would go out of cultivation here in the end, although it might be much better for the nation that the land should be kept as arable land; but on the other hand, with the increased expenses on arable land in the shape of labor, there was no doubt that the land in this country would rather be turned into grass. With regard to Mr. Mechi's facts, he would like to touch on one, viz., his idea of manuring the subsoil, and he would convict him out of his own mouth, for Mr. Mechi said: "You cannot manure the subsoil because the whole of the manure is retained in the top soil;" and then he said that when he applied a lot of liquid manure to a field that was drained five feet deep, the water ran through the subsoil and emerged from the drain discolored.

Mr. Mechi: Down the cracks.

Mr. Read: Down the cracks; but it proved that the liquid manure went into the subsoil. Every tiller in Norfolk knew that they did not want to manure the subsoil; the great thing was to have the manure in the topsoil. If Mr. Mechi were to sow a quantity of guano in a hungry gravel soil, he would find a portion of the manure washed far below the roots of the plant. Then Mr. Mechi had referred to sewage. What had science done for sewage and for the manure of towns? Sanitary and hydrau-

lic engineers had done more harm than any one else by sweeping valuable manure into the nearest stream to the great detriment of the health of the neighborhood. What had science done in teaching the causes of clover sickness, though that was a matter in which they might expect science to assist? Had the chemist told them how they could strengthen the straw of their cereals?

Mr. Mechi: Yes.

Mr. Read said he would like to know what? He would guarantee any one a fair fortune who would say how in England they could maintain a large crop of cereals without the danger of their lodging. The man who discovered that would be a benefactor to agriculture. The limit to the cultivation of cereals at present was, that after growing a certain quantity of wheat or barley, and especially barley, the straw went down, and inferior yields were afterwards produced. In conclusion, Mr. Read said, that they must have practice and science combined. He believed it was Baron Liebig who said, "There is more nourishment in bean straw than clover hay;" and an old farmer who heard this said, "But if I were a horse I should still prefer the hay." (Laughter.)

Dr. Voelcker said he felt bound to make some defense on behalf of the science of agriculture against the not very flattering remarks that had fallen from Mr. Read. If what Mr. Read said was true, men of science were very useless creatures. Of what use were they if they had never done anything for the farmer, and were never likely to do anything? Now, he believed that a great deal had been done for the farmer by scientific men, a great deal was being done, and a great deal of useful work lay before them to do in the future. It was, however, a bad plan for a man to blow his own trumpet, and he did not like to stand there and blow the trumpet of science as against practice; but he hoped some one would take up the cudgels against some of the views expressed by Mr. Read. Some of the remarks which had been made about burnt clay struck him as a forcible illustration that science was of a real practical value to the farmer. It was stated that in some cases the burning of clay did not improve it, while in other cases it effected a very great improvement—and it was a very great improvement to Mr. Mechi's stiff clay. Now, it was just on such a point as that that science could enlighten them, for it told them from time to time whether or not the fertilizing elements were developed and rendered valuable by burning. Mr. Mechi's clay abounded in silicates of potash and soda in a locked up state, phosphate of lime, and other elements which, on burning, were rendered extremely useful for vegetation. Mr. Smythies had expressed some commiseration for Mr. Mechi, because he had had to contend with that poor Essex clay; but he (Professor Voelcker) differed entirely from Mr. Smythies on that point; he thought Mr. Mechi had shown great pluck in tackling that clay, and he would be rewarded for it in time, if he were not rerewarded already for the energy he had displayed in cultivating a soil which had the name for being very infertile, which, in its natural state, was sterile, and which, nevertheless, contained abundant stores of plant food. That land needed burning and the application of lime, and especially to be worked by the steam plough, which he strongly advised Mr. Mechi to make use of, and then he need not be afraid of exhausting his soil. Some land might be exhausted in a very few years, but Mr. Mechi's stiff clay would stand very heavy cropping for a great many years with an occasional dressing of the somewhat despised guano. Mr. Mechi, if he cultivated deeply his clay land, would find nothing more profitable than Peruvian guano, which was especially rich in ammonia, and the richer in ammonia it was the more profitable it was on these stiff clays. He had no fear of the exhaustion of land after a time where guano was constantly applied. It had been asserted that guano was exhaustive to certain lands; he had made every inquiry, and he could not find it so. He always found the more guano the heavier the crop, and he had not found an instance of land exhausted by it. (Hear, hear.) He had much more fear of the exhaustion of the supply of guano than of the exhaustion of the land. It was, indeed, a very serious question what they should do when the guano failed them. They would then be thrown upon the use of nitrate of soda, and it was as well that they should begin to see to what advantage nitrate of soda could be turned. There was great danger in using nitrate of soda injudiciously, for if there were not the mineral elements in the soil to build up the plant, nitrate of soda would do no good. It was like plying with the whip a horse whose strength was gone. He had had opportunities of seeing the unfortunate influence of nitrate of soda on poor soils. At the same time it was a valuable assistance in conjunction with other manures—phosphatic manures and potash salts. He did not altogether agree with Mr. Mechi on some of the chemical points upon which he had touched, nor did he agree on all those points with Baron Liebig. There was not a shrewder or more intelligent philosophical mind—and at the same time a good, practical mind—than that of Baron Liebig. He was a man of very powerful perception, and if he had had the advantage of only a year or a couple of years' experience in this country he would have been the first man to modify many of the views he had expressed in rather strong language. And one of these points was with regard to the manuring of subsoils. He did not think the farmer should ever apply manure to subsoils. (Hear, hear.) He (Professor Voelcker) would say to the farmers: "Don't manure subsoil of any kind, light or heavy; manure the topsoil, and keep the manuring elements as near as you possibly can to the surface, so that the young plant may derive immediate advantage from the food prepared for it."

Mr. C. S. Read: Do you agree with Mr. Mechi that it is impossible to manure the subsoil through the topsoil?

Professor Voelcker: I decidedly think that Mr. Mechi is wrong in that. The subsoil can be manured to a certain extent through the topsoil. And it is as well to bring up a little of the subsoil and get back the elements of fertility which have sunk down through the topsoil. This reminded him of certain facts which showed how careful we ought to be in generalizing from what he would call half-understood facts in agricultural chemistry. It was very natural to make that mistake when a discovery was made, because we did not know the full extent of the facts involved. When it was discovered that plants absorbed ammonia, leaving the sulphuric acid to pass through the soil, it was thought that fertilizing elements might be stored up in the soil and the soil become permanently enriched; but then it was not known how rapid were the changes which ammonia undergoes in the soil. It was a mistake to suppose that ammonia would remain permanently in the surface soil. It would get rapidly washed, in the shape of nitric acid, into the subsoil. Fertilizing elements could not be permanently stored up in the soil. It was not possible permanently to improve the fertility of the land. The best thing the farmer should expect, after applying artificial manures to the land, was a heavy crop, and not to look forward to profit by the ultimate improvement of the soil. Frequent manuring was the most profitable mode of procedure, but to manure with a view to the future was, in a great measure, all moonshine. Unless they saw their money back which they expended in manure in the weight of the crop to which the artificial manure was applied, they had better keep their money in their pockets. If the manure was not utilized at once it passed, in a great measure, into the drainage water, and he was not at all sure that there was not more fertilizing matter lost in the drainage and carried away than ever passed into the crop.

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Sc/c.L.5.

THE JOURNAL

OF

The New-York State Agricultural Society.

VOL. XXII.] ALBANY, JULY AND AUGUST, 1872. [NOS. 7 & 8.

State Agricultural Rooms.

The Office of the Society is in the New Agricultural Hall corner of State and Lodge streets, Albany.

ANNUAL MEETING.

Pursuant to amendment of the constitution adopted at the Annual Meeting of 1872, the Annual Meeting will hereafter be held on the Wednesday succeeding the Third Tuesday of January in each year, at the City of Albany.

Annual Meeting of 1873, January 22d.

VOLUMES OF TRANSACTIONS WANTED.

The Transactions of the Society for the years 1841, 1842, 1846, 1847, 1848, 1852, 1857, 1858, 1859, 1860, 1861, are wanted, to complete sets, and members are requested to assist in obtaining them. Other volumes will be given in exchange, or payment made in money, if preferred.

THE THIRTY-SECOND ANNUAL FAIR

OF THE

New York State Agricultural Society

WILL BE HELD AT ELMIRA,

September 30 to October 4, 1872.

ENTRIES CLOSE AUGUST 31,

After which date, nothing except fruits and flowers can be entered either for exhibition or competition for prizes.

New-York State Agricultural Society.

EXECUTIVE MEETING, JULY 12, 1872.

The Executive Committee of the New York State Agricultural Society met at the Rathbun House, Elmira, on Friday, the 12th day of July, 1872, at 10 o'clock, A. M.

There were present, the President, Vice-Presidents Wing, Doncaster, Curtis, Diven, Angel and Pendry, the Corresponding Secretary, Messrs. Juliand, Bristol and Holmes of the Executive Committee, and Ex-President Faile.

Letters and excuses for non-attendance were received from Vice-President Thorne, Messrs. Thayer, Lewis, Swan and Cole of the Executive Committee, Ex-President Church and the Treasurer.

The minutes of the last meeting were read and approved.

The following appointments of Superintendents of Departments at the Fair were made, viz:

Cattle—THOMAS V. MAXON, Adams.
Horses—JOHN F. QUICK, Suspension Bridge.
Sheep and Swine—C. PORTER ROOT, Butternuts.
Poultry—CHAUNCEY BOUGHTON, Waterford.
Implements, etc.—JULIUS W. SMITH, Fairmount.
Grain, etc.—RUSSELL W. PRATT, Fort Edward.
Fruits, Flowers.—JAMES VICK, Rochester.

And the appointment of the Superintendent of Mechanics' Hall was referred to Vice-President Wing, in charge of the Miscellaneous Department.

The Committee then proceeded to the selection of Judges for the approaching Fair.

On motion of Vice-President Curtis, it was ordered that at the approaching Fair all thoroughbred cattle be judged (as far as practicable) by the scales of points adopted by the society, except Holsteins, for which no scale exists, and excepting also that for Jerseys the scale now in preparation by the American Jersey Cattle Club be used, if perfected in time, otherwise the scale of points established by the Royal Agricultural Society of Jersey, as used in that Island and not as lately in use at the Fairs of this Society.

The Committee then proceeded to open the bids sent in for erecting the proposed buildings at Elmira, being five in number.

On motion of Vice-President Angel the following resolution was adopted:

Resolved, That it is the sentiment of the Executive Committee of the New York State Agricultural Society, that in case the citizens of Rochester shall donate to the Society suitable and eligible grounds for the purpose, embracing not less than fifty acres, that city should be designated as one of the points for a permanent location of the Fairs of the Society.

On motion of Vice-President Wing, it was

Resolved, That this board approve of the acceptance by the Building Committee of the proposition of Mr. Charles H. Spaulding, for the erection of the buildings, fences, etc., on the Elmira Fair Grounds for the sum of $31,200, according to the plans and specifications prepared by the Society's architect.

EXECUTIVE MEETING, AUGUST 9, 1872.

The Executive Committee of the New York State Agricultural Society met at the Agricultural rooms, Albany, on Friday, the 9th day of August, 1872, at 10 A. M.

There were present, the President, Vice-Presidents Wing, Doncaster and Geddes, the Corresponding Secretary, the Treasurer, Messrs. Thayer, Lewis, Swan and Bristol of the Executive Committee, and Ex-President Faile. Letters and excuses for non-attendance were received from Vice-President Thorne, Mr. Juliand, Mr. Holmes and Ex-Presidents Patrick, Campbell and Church.

The minutes of the last meeting were read and approved.

The Secretary reported that the second contractor for the Elmira buildings having abandoned the work on the 29th ult., such members of the Building Committee as could be assembled had conferred upon the subject, and had accepted a proposition made by Mr. Bristol, viz.: that he would, if possible, make a contract with Mr. Charles C. B. Walker, of Corning, for the Society, on the same terms as the last previous contract, and if unable to do so, would proceed as agent of the Society to purchase the material and erect the buildings, fences, etc. That Mr. Bristol had made such contract with Mr. Walker, inducing him to take it only by promising his own aid in carrying it out, and that work had been begun and was proceeding rapidly.

Whereupon, Mr. Thayer offered the following resolutions:

Resolved, That the action of the Building Committee and the execution of the contract with Mr. Charles C. B. Walker, of Corning, for $34,000, are approved.

Resolved, That the Executive Committee approve of the expenditure by the Building Committee of such sum as may, in their judgment, be necessary for the grading and improvement of the grounds at Elmira, with all the economy possible, but that said committee shall not expend upon the Elmira grounds and buildings in the aggregate more than ten thousand dollars in excess of the amount received from Chemung county.

Which resolutions, after debate, the question being put, were adopted.

On motion of Mr. Bristol, it was

Resolved, That the fence on the south line of the fair ground at Elmira be set back four feet, in case it shall be necessary, to conform the line to that of the street on the west side of the railroad.

And, on motion, the Committee adjourned.

HOME PRODUCTION OF EGGS AND POULTRY.

(From *Bell's Messenger* of July 15th, 1872.)

At a late meeting of the Breconshire Chamber of Agriculture, Mr. M. Kinnard B. Edwards, of Sarn Farm, Bridgend, read a paper on "The Home Production of Eggs and Poultry in a Commercial point of View," from which we make the following extracts:

"Whatever we have to pride ourselves upon as a nation, it certainly is not the quality or quantity of our poultry; and, as long as we continue to look abroad for this stupendous supply of eggs (500 millions) the less we say about our poultry or poultry shows the better. Until within the last year or so the prices asked by the breeders of the best stock, for really good birds have been so exorbitant as to preclude the farming and cottage classes from purchasing, however much they might be inclined to improve the stock; but now good stock birds are to be had at 7s. 6d to 10s. each, and this cannot be considered a great price for a huge Brahma cock weighing 9lbs. or 10lbs., and eggs from these birds are now advertised in any number from 3s. to 5s. the setting. I will direct my remarks particularly to several newly introduced breeds of foreign fowl, and endeavour to point out the particular advantages these several breeds of fowl possess in a pecuniary or commercial point of view. I will commence with the Brahma, as being probably the most generally useful and important of the comparatively new introductions. The advantages that this breed possesses pre-eminently over all other birds, are its extreme kindness, docility, great size, and being a good layer, especially through the winter months, when eggs are most scarce and valuable. The Brahma is a good winter layer and equal to the Cochin as a sitter and good mother to rear strong and hardy chickens, and when crossed with the Dorking, produces admirable egg-layers.

It is not uncommon for Brahma cocks to attain the weight of 12lbs. and 14lbs., and hens 10lbs. and 12lbs., each bird. This is about the weight of two couples of common barn-door fowl. The Houdan is the celebrated French fowl (the Dorking of France). The advantages this breed possesses are its early maturity and great readiness to fatten, being particularly light in the bone and delicate in flesh; it is also a precocious layer of large white eggs, throughout the year, never desiring to sit. It is no exaggeration to say that the Houdan will fatten upon the same food that will scarcely keep other fowls in ordinary condition. The Crêve Cœur is a magnificent jet black bird of very considerable size, and possibly the most precocious fowl known to fatten. These birds are now well established in this country, so much so, indeed, that it is easier to purchase thoroughly pure and good specimens for stock purposes here than it is in France.

Among the most celebrated of the English breeds come first the Dorking, followed by the game and Hamburgh. The disadvantages the Dorking possess are the delicacy and difficulty in rearing the chickens, and the liability of the breed to disease, save in the exceptionally warm and dry localities. The game is to the other breeds, what the race-horse is to the more common breeds of horses. The value of the game lies rather in its great courage, bold spirit and great beauty, rather than in possessing any super-excellent qualities in a commercial sense. The Hamburgh varieties have been established for centuries amongst us, and may be looked upon as an English fowl, although the first stock was probably brought here by a Dutch merchant trading with this country. Such precocious and

determined egg-layers are these birds that they have earned the well merited name of every-day layers or everlasting layers. It is not at all uncommon for Hamburghs to lay from 250 to 280 eggs in the year, and occasionally three hundred are obtained from a single bird. Two hundred and forty would, I think, be a fair average yield from this breed. For table purposes they cannot be much considered, owing to their small size. They are, however, plump and well flavored, and make excellent roast chicken. They are small eaters and very busy caterers for themselves and obtain a larger proportion of their necessary food by searching about for it. In this respect they, with the game, are essentially a farmer's fowl.

The black Spanish or the white-faced Spanish cannot now be considered other than a fancy fowl. The Spanish have ever been noted as good summer layers of a large white egg, and were it not for its black legs, would be highly esteemed for table purposes from the whiteness and delicacy of its flesh. The first thing to be considered by those who keep fowls should be to obtain that breed most suited to the climate of the locality, as well as the accommodation and convenience of the individual poultry keeper. To the farmer who possesses an unlimited grass run, with farmstead well sheltered and soil dry, the Houdan or Brahma Dorking would be found the most generally useful and profitable breed to keep. As layers, considering the size of their eggs, they are not to be surpassed; and as table birds, heavy, large and meaty, with readiness to fatten and quick growth to maturity, they will always command a ready market and the highest price.

To the cottager who is obliged to confine his fowls within a narrow space the Brahma, or Crève Cœur will probably be found the most profitable and satisfactory, combining egg-producing power and flesh-forming propensity in the same bird, and less likely to suffer from confinement than any other bird, as they are found to thrive in a space where Houdans, Dorkings or Hamburghs would pine and die. For the production of eggs in winter these birds are not to be surpassed, and this is a necessary qualification for the profitable keeping of fowls in a confined state, inasmuch as the increased price eggs obtain in winter will compensate for the increased cost of keeping fowls depending entirely upon hand feeding.

There are certain rules that must be practiced to make fowls profitable. The first is to keep your stock young, and clear off your birds at that age at which they leave the largest profit. Secondly, to hatch your chickens as early in the spring as possible, so as to give them advantage of the entire summer, to hasten them to laying maturity, and so obtain as early a supply of eggs as possible, and at a season when they command the highest price. Thirdly, to keep a breed of fowl that is hardy and comes early to maturity, easily fattened for the table, and a precocious and prolific egg layer. Fourthly, comfortable housing, together with a regular supply of sufficient food to keep them in laying condition. Now I think that most present will agree with me when I say that the observance of these essential rules is the exception and not the rule among the general run of poultry keepers.

I will now direct your attention to a simple, inexpensive and rational system of poultry management, such as may be practiced by all, and one that will not fail to return a splendid profit, from this most profitable branch of husbandry, practiced as it should be, and I shall conclude by showing the national importance, in a commercial point of view, of producing the 500 millions of eggs we now import. I will illustrate the profitable management of a small poultry yard by describing that which I see practiced at an imaginary model farm, where fowls are kept as they should be, and made to return a clear annual profit averaging 10s. to 12s. per bird, or a total annual profit of £37 from 60 laying hens and an equal number of fatted chickens. I visit this farm early in November, and I find a fine, healthy stock of Brahma-Dorkings, Houdans, and silver spangled Hamburghs. I am taken to the hen house, which I find to be a simple structure, built in a sheltered situation facing south-east. It measures 8 feet long by 4 feet wide, and 7 feet high. The perches are all placed at a uniform height of 3 feet from the ground, and the nests are arranged at one end in two tiers, one directly over the other, one row on the ground for the setting hens, and the smaller nests directly over them for the laying hens. The building is perfectly dry and free from damp, airy, well ventilated at the top, and rather light. The floor is asphalte, to prevent the damp rising from the ground. At the time I visit the yard, early in November, the pullets hatched during the past March are commencing to lay, to replace the older hens hatched the year previous, which, after they have done laying, are now being fattened and killed off at the age of 19 months. These pullets continue to lay off and on through the coming winter and following summer, laying an average of 180 eggs per bird between this time and the following autumn, at which time they in their turn are killed off to make room for that year's succession of pullets then commencing to lay. These eggs, one-half of which are produced during the winter months, and fetch 15d per dozen, and in the summer 9d per dozen, realize a total of 15s. per bird, and each one fattened and disposed of in autumn at the age of 19 months, will realize 2s. at 4d per lb., their average weight exceeding 6lb. This gives a total of 17s. as the return from each laying hen, killed at the age of 19 months, exclusive of the value of their manure made during the time. Some few are allowed to live another year, and are killed 12 months later, as these older birds make the best brood mothers and lay an increased number of eggs the second summer; and in cases where poultry keepers are unsuccessful in rearing chickens, and have not necessary accommodation for doing this, they will find it to their advantage to kill off their hens at the close of their second laying season instead of the first. The system of feeding practiced at this farm is as follows: The fowls leave their roost at the first rising of the sun, and are out and about for two hours picking up the early worms, etc.; at eight o'clock they get their morning meal, which consists of a mess of meal mixed to the consistency of a stiff dough, 1¼ ounce being allowed to each bird. This meal is continually varied, one time oatmeal, another barley meal or Indian corn meal, or brank or buckwheat meal, and a small quantity of bran being mixed through it; this is thrown to them on some clean spot, each fowl being allowed as much as it will pick up greedily. Mid-day they get a small allowance of boiled potatoes, parsnips, carrots, or mangolds hot, with a little bran and chandlers graves, or other stimulating substances, mixed through it, and at four o'clock, before retiring to roost, they are supplied with whole grain at the rate of 1¼ ounce to each bird, a change in the variety given being made twice a week. The cost of the feeding I have described, throughout the year averages 1¼d to 1½d per week per bird; taking the price of grain at 1d per lb.—a fair average price—and this feeding is found to keep the

stock in the highest possible state of health and profit. Five or six broods of chickens are hatched every March to replace the hens killed off each autumn, and so a succession of young and profitable birds is being continually kept up. A little dry mould or earth is sprinkled twice a week over the droppings of the fowls in the hen house, to deodorize their excrement, fix the ammonia, and keep the house sweet, and so render the manure as valuable as possible, and obviate the necessity of continually cleaning the house. This manure and earth is removed every two months, and used upon the farm or garden, and found to be nearly equal in its fertilizing power to guano. Two or three broods of chickens are reared for market purposes during the months of March, April, May and June, of either the Houdan, or Brahma-Dorking breed. The chickens are forced on by liberal feeding and continual change of food so as to get them ready for market as soon as possible. The chickens are usually fit to kill at the age of 11 or 12 weeks. During this three months they are estimated to consume food to the value of about 1s. 5d, besides what they gather for themselves, at which age they weigh from 4½ to 5 lbs., and realize 8s. 6d each, leaving a profit of about 8s. on each chicken. The young chickens are cooped for ten days with their mothers upon a grass plat, and fed upon a variety of nourishing dainties to give them a start in life; after this time they are allowed their liberty with the hen and fed liberally three or four times a day. At the age of ten weeks they are confined for a fortnight, and fed upon as large a quantity of fattening food as they can be induced to consume, chiefly oat meal and milk; they are then killed and disposed of. The profit derived from fattening for the market (considering the risk and attention necessary), is not at all equal to that realized by laying stock. The former require little or no attention beyond mixing and throwing them their food two or three times a day, and daily collecting their eggs, and the manure made during the 12 months is estimated to well cover all cost for attendance. The casualties that arise from the death of chickens are found to be very trifling. Suppose one-third of each brood to die before they attain the age of eight weeks, the cost of food consumed by a young chicken of this age will certainly not exceed 3d or 4d, and what a trifle is this deducted from the 10s. or 11s. clear profit realized in 12 months by each fowl that comes to maturity. Well, to sum up the total receipts and expenditures of this lot of fowls it would be found to be as follows: On the debtor side we have

Dr:—	s. d.
Cost of rearing and feeding 60 laying hens to the age of 19 months, at the rate of 1½d per week for grown birds, and half the amount during chickenhood, each - - - - - -	6 8

Well, on the credit side we have—

Cr:—	
Fifteen doz. eggs at an average price of 1s. per doz., *i. e.*, 9d in summer and 15d in winter, will realize - - - - - - -	15 0
Value of fowl when killed in the autumn at 4d per lb. say - - - - - - -	2 0
	17 0

Now deduct the above cost for rearing and keep during 19 months (6s. 8d) from the 17s., and we have a balance of 10s. 4d, a clear annual profit from each laying hen, and as I have showed before, a profit of 2s. in three months from each chicken reared for market, will thus give—

60 hens at 10s. 4d - - - - - -	£31 0s.
60 chickens reared for market - - - -	6 0s.
	£37 0s.

representing the clear profit annually realized from this comparatively small stock of poultry. It is estimated that a fowl will void at least 1 ounce of dry excrement during the 24 hours; and allowing this manure in a dry state to be worth 5s. per cwt., which is certainly a moderate price, we have the 19 months' manure from each fowl to the value of 1s. 9d, or a total on all the fowls of £6 5s. which allows over 2s. per week to cover the cost of attendance. Profits such as I have here described, I think all will admit will favourably compare with that realized from other farm stock and this obtained at far less risk and outlay than that involved in other stock.

It will be asked upon what ground fowls can be supposed to realize a larger profit than other animals. The answer is a simple one. In the first, place fowls obtain at least one-half their living at no cost whatever to their owner, upon what may be called waste food. such as worms, slugs, flies, beetles, grubs. grass seeds, waste corn, and vegetable food, all of which they gather for themselves, at no cost to the owner; whereas cattle, sheep, pigs, etc. depend wholly upon food purchased or raised specially for their use. Again, the average price realized in the carcass for beef and mutton is only 4d to 5d per lb., whereas the price of fowl meat is at least 9d or 10d per lb., although produced at much less cost; and again, the profit realized by the eggs produced in proportion to the food consumed is far greater than that realized by producing meat. It may also be considered that an average yield of 180 eggs in the 12 months is a high average, but those who keep the best and most improved breeds, properly fed and cared for, exceed this average, 230 and 250 eggs being commonly obtained from certain breeds. It will also be considered by some that 8s. or 3s. 6d is a stiff price for a chicken, and no doubt it would be for the wretchedly small sized, half fed birds one sees exposed in our country markets for sale. A large, meaty, well-fed Houdan or Brahma-Dorking chicken, weighing 4½ to 5 lbs. will as readily fetch 8s. 6d as a small barn-door fowl one-half its size will realize 2s. or 2s. 8d. Although fowls are not sold by weight, a purchaser is entirely guided by the size, condition, and general appearance as to the price he will give. It therefore comes to much the same thing. It is absurd to say, as some do, "Oh, a fowl is a fowl, and you will find no one to give more than 5s. a couple, no matter how big and good they are." I have sent fowls to market that weighed from 8½lbs. to 9lbs. of the Brahma-Dorking breed, and my experience is that an extraordinary large and well-fed fowl will fetch a fancy price, really more than its intrinsic value.

Before concluding, I will make a few remarks with respect to ducks. Ducks are, under certain conditions, among the most profitable stock of the poultry yard. Those who possess plenty of marshy ground can keep ducks at little or no cost, as they will, under these conditions, find their own living; but in places that do not afford these advantages, ducks are amongst the most ruinous and unprofitable creatures connected with the farm yard, managed as they commonly are. The Aylesbury people, who are perhaps the most successful duck breeders in the world, adopt a system that is almost

unknown, certainly unpracticed elsewhere. It is said that upwards of £20.000 is annually received in this district alone for the ducklings sent to the London market. The system adopted by these breeders is to bring ducks into the London market at a season when none are to be obtained elsewhere, and they consequently obtained a monopoly, and realize enormous prices. The Aylesbury breed commence to lay a month or six weeks earlier than any other breeds, and these eggs, laid often in the depth of winter, are at once set under hens, and, when hatched, the young are hastened to maturity with amazing rapidity. They are kept in a warm, sheltered situation, and fed upon the most nourishing food, and never allowed access to water. Oat meal and milk form their chief diet, and sometimes more stimulating food is added. These ducks grow, fatten, and feather with rapidity. In less than 8 weeks from the time they leave the shell they are in perfect feather, and ready to send to market. In places where ducks have to depend on hand feeding for their living, they can only be kept profitably by bringing them rapidly to maturity and killing them before they take to the water or begin to lose their feathers.

AGRICULTURAL EDUCATION.

Paper read before the N. Y. State University Convocation at Albany, August 7, 1872, by Hon. JOHN STANTON GOULD, Professor of Mechanics applied to Agriculture, in Cornell University, etc. etc.

Americans most fully believe that they are a practical people : they feel that they are complimented when this attribute is ascribed to them, and mortified when it is denied to them.

In some respects they deserve the title. In general, they prepare their sons and daughters for the special callings that they are designed to follow, by a careful preliminary training in their principles and practices.

Blacksmiths, carpenters, masons, goldsmiths and tailors serve apprenticeships to those trades before they can practice them. Musicians are taught the principles of acoustics. the theory of vocalization, and the practice of the scales, before they can teach music or practice it in public. No one thinks of practicing law, physic or divinity without long and careful training in the proper schools.

No board of railroad directors would expend a single dollar on a track that had been located by a segar maker or constructed by a veterinary surgeon, or by any other than an educated and well-trained engineer.

If any one should attempt to practice either of these trades or professions without this thorough preliminary training, practical men would predict a disastrous issue to the undertaking.

Although in these, and in many other respects, Americans vindicate their claim to be a practical race, there are other things in which their conduct is as unwise and unpractical as can well be imagined. They strangely enough imagine that a man can be a successful farmer without any special education whatever, although he is confronted in every step of his progress with the most recondite processes of nature which require for their elucidation an encyclopedia of all the sciences.

The chief advocates of this strange doctrine are the farmers themselves. If it were possible to summon all the farmers of the United States before this Convocation and to question them severally with respect to their views of agricultural education, a very few would answer in all the fervour of a deep conviction that a thorough education was indispensable for a successful farmer, and that his success would be exactly proportional to the extent of his acquisitions.

A larger number (but as compared with the mass a very small class) will tell you that special education is indeed desirable for a farmer, but you well see at once that there is no heartiness in their averments.

They have an idea that this is the proper thing to say, that education is, on the whole, rather ornamental, but down in their hearts they do not really believe that any amount of education would enable a man to raise a greater amount of grass, grain or roots from an acre of land than he would raise if he was entirely uneducated, or that he would reap any greater profit from his farm.

But the overwhelming majority of the assembled mass would ridicule the idea of educating farmers for their work. They would not hesitate to tell you that agricultural education was "a humbug" of the silliest kind, and that all that the young farmer needs is a little practical experience; book-knowledge would only make him lazy and conceited.

Since farmers do not demand any education for their sons to fit them specially for the agricultural calling, it is not surprising that teachers have made no attempts to supply a kind of instruction which their patrons do not require, and which would in fact be offensive to them.

The utter apathy that exists in the public mind with respect to the prosperity of agriculture and to the education which must be the foundation of it, is one of the most curious psychological problems ever presented for solution. It is not only amazing but disastrous; it weighs like a millstone on all human progress, and all human civilization, and its removal will do more to elevate and ennoble the race than any thing that can be mentioned.

Let us look a little at the facts and see if these things are not true.

We all, indeed, acknowledge, when we are questioned on the subject, that agriculture is of the utmost importance to the whole human race, but we acknowledge it because we are accustomed to do so, because everybody else says the same thing, and because we read it in approved books; it does not exist in our minds as a living, fruit-bearing proposition; it never leads us to take any action to correspond with it.

The importance of an intelligent agriculture appears:

I. Because the great struggle of our race is to provide food, drink and clothing. The necessity for this provision dominates over our whole lives, and, to a very great extent, regulates all our conduct. When George III desired to bestow some acceptable mark of favour on a labourer on his farm at Windsor, to whom he was much attached, he asked him what he could do for him. "Well," said the man, "if your Majesty will only give me as much as I need to eat, drink and wear for the rest of my life, I shall have all I want, and be very thankful for it." "Indeed you may be," said the monarch; "although I am King of Great Britain, this is all I get myself."

Now these are the very commodities that it is the business of agriculture to furnish to mankind. The farmer alone produces meat, breadstuffs, milk and sugar for food; cotton, wool, flax, hemp, silk, etc., for clothing.

If the labor of the farmers were intermitted for a single year, the whole human race would perish. This fact alone establishes the primacy of agriculture beyond a question. You cannot say the same thing of any other calling whatsoever. All other callings might suspend their labors for one year or for ten years, and though

the intermission might cause much inconvenience the framework of society would not be destroyed.

II. All experience shows that population invariably presses upon the supply of food. If you can double the supply of food in ten or twenty years, you will double the population in ten or twenty years. If you diminish the supply one-half, or one-fourth, the population will be reduced in a corresponding ratio. The population of the world is reckoned at one 1,000,000,000 and they eat all the food that is raised upon the planet; nothing is wasted, nothing is left over. I remember when the population of the United States was 9,000,000 of souls and we raised just enough to support them. We raise more than four times as much food, and of the raw material of textile fabrics as we did then, and our population is now 38,000,000. In other words, the population has exactly kept pace with the supply of food. If the supply of food had been reduced, the population instead of increasing would have diminished in a corresponding ratio. Thus agriculture is invested with the awful power of creation and destruction. No other trade or calling has the power of increasing the world's population.

III. There is an intimate, though generally unnoticed relation between the cheapness of food and the morality of a nation; or perhaps the proposition will be more striking if we say, the scarcity and dearness of food is a cause of immorality. This assertion is thus proved. If we take the average price of food for each year of a century, and place it in the first column of a table prepared for the purpose, opposite to that year; if we then place the number of marriages in the next column, the number of illegitimate births in the next, and the number of crimes in the next, each opposite to the year of their occurrence, we shall find that in the years when food is the cheapest, the greatest number of marriages occur, there are fewest illegitimate births, and the fewest crimes are committed On the contrary, when food is dearest, there are the fewest marriages, the greatest number of illegitimate births, and crimes increase both in number and malignancy. All experience shows that a cheap and abundant supply of food is conducive to higher civilization manifested in a greater refinement of manners, a more elevated and comprehensive system of education and a higher social enjoyment.

It was the abundance of corn produced by the overflow of the Nile which nourished the arts and sciences of ancient Egypt, that made her the mother and the mistress of early civilization. The wondrous intelligence and social supremacy of Athens had its root in the fertile soil of Attica, and in the intelligent skill of the tillers of that soil.

On the other hand, barbarism is always the result of a precarious food supply. The wandering Indian, and the stupid Hottentot never can be elevated into civilization until his food becomes abundant. When the plains of Babylon were artificially irrigated, they supported a teeming population that was educated, happy and prosperous; when that system of irrigation was abandoned the population grew sparse and lapsed into barbarism, and that once fertile and prosperous region is now the habitation of wild beasts.

IV. The importance of agriculture is illustrated by the enormous bulk of its productions and their aggregate commercial value.

Our production of potatoes, hay, corn, wheat, rye, oats and barley in the year 1869 was 67,348,000 tons. Their aggregate value was $1,411,383,000.

I have not included the weight or the value of the meat, the wool, the sugar, the honey, the cotton, flax, hemp or silk; the milk, cheese, butter, eggs and hides; the fruits, market truck or tobbaco raised upon our farms. If the value of these and similar articles of production are taken into the account, we shall have a total annual value exceeding $2,500,000,000, which very considerably exceeds the amount of our national debt.

In view of the facts stated under these four heads, have we a legitimate claim to the character of a practical people while we utterly ignore the claims of this great foundation interest for special educational facilities?

Ought not the nation, as such and in its collective capacity, to watch with eager interest over the success of a calling that lies at the very root of civilization, of commercial prosperity; nay, at the very existence of society?

We can show most conclusively that there is a real necessity for this national care and oversight, because the soil is not at the present moment yielding more than half or even a quarter of what it is capable of producing, and that the present cultivated area might support double or quadruple its present population in a vastly higher degree of prosperity than it now does.

These are the facts: The average production of hay per acre in the United States was, in the year 1869, 1.23 tons per acre. This was also the average production for the State of New York. This was a year, it must be observed, in which the production, owing to very favourable climatic conditions was nearly twenty per cent. better than ordinary.

Every one knows that this average production is far below the production of our best and most intelligent farmers, who rarely cut less than two or three tons to the acre.

The annual value of the hay crop of the United States is $400,000,000. If, therefore, we could make two blades of grass grow where only one grew before, we should add $400,000,000 to our annual revenue. Such an addition would benefit every individual in the country. It would pay our national debt in five years. Now, our best farmers not only raise two, but three blades of grass where the average farmer only raises one. But the produce of our best farmers is far below the maximum capacity of the soil. Five tons have often been cut from an acre in this country, and from a celebrated meadow in Edinburgh, twenty tons have been taken annually in seven successive cuttings. If we could teach our farmers to bring their averages up to this point, we should, to borrow Dr. Johnson's phrase, find that our meadows possess "potentialities of wealth far beyond the dreams of avarice."

This great discrepancy between the actual and the possible production is quite as apparent in other crops as it is in the grass crop. The value of our corn crop for the year 1869 was $601,839,030. The average production per acre was 28 3-10 bushels per acre. This is less than one-third of what our best farmers are accustomed to raise on an acre. One hundred bushels is no uncommon crop. The State Agricultural Society of Indiana in 1860 gave a premium on a crop of 203 bushels to the acre. If our average crop could be increased (as it might be) three-fold it would add $1,200,000,000 to our national income.

The same thing is true of our wheat crop. The average yield throughout the United States is 12 bushels to the acre. But many of our best farmers raise 40 bushels. Thomas Powell of Niagara county, N. Y., took a premium from the New York State Agricultural

Society for a crop of 70 bushels to the acre, and 162 bushels to the acre have been raised in England.

I could in the same way prove the same discrepancy between the actual and the potential production of all other crops, but the examples already given will suffice. It is enough for my present purpose to show that by raising the average production through the whole country of hay, corn and wheat alone up to the standard of production of our best farmers, we should increase our annual agricultural revenue more than $2,400,000,000 per annum. As "practical men" we ought at least to make an effort to secure this brilliant prize.

What is the reason that the average farmer does not get more than one-third as much from an acre as the first-class farmer does? The answer may be given in a single word, and that word is, ignorance. The reason that they do not raise maximum crops is, that they do not know how to do it.

You cannot talk with the great majority of our farmers for half an hour without seeing that they are ignorant of the elementary principles of agriculture; that they know little or nothing of those matters which lie at the very base of successful and remunerative agriculture. I will give some examples of this.

There are about 6,000 species of grass known to botanists. From 125 to 150 species are indigenous in the State of New York. There is hardly a farm in the State where from ten to fifteen species do not grow. Yet farmers who have lived on those farms and mowed the meadows for fifty years, do not know the names of these different species; they cannot tell the plain marks by which they are severally distinguished.

You can hardly find fifty farmers in the State who can tell the difference between Meadow Fox-tail (*Alopecurus pratensis*) and Timothy (*Phleum pratense*). And yet there is nothing about grass that a farmer needs more to know.

The former is of great value as a pasture grass. It will furnish a good bite for cattle three or four weeks earlier in the spring than the latter will, and when gnawed off clean on one day will afford a good bite again the day but one after. The latter, though not valuable as a pasture grass, is of pre-eminent value as a meadow grass. It will give 23 lbs. more of dry hay to 100 lbs. of grass than the former. It contains twice as much flesh-forming matter, three times as much of fat-forming, and two and a half times as much heat-making material. Yet farmers will sell both kinds at the same price, and will take no more pains to encourage the growth of one than the other. They suffer of course an enormous loss in consequence. If farmers are ignorant of such vital facts as these, it is certainly a pretty plain proof that better agricultural education is required.

They are as ignorant with respect to grain as they are about grass. There are about 150 varieties of wheat cultivated in this country. Some of them are adapted to sandy lands, some to heavy, some to light loams, and some to stiff clays; some to wet lands and some to moist lands. Some have stiff straw and some soft and weak straw, some make white and some dark flour, some abound in gluten and some in starch. A barrel of flour made from some kinds of wheat will make 250 lbs. of bread, while others will make 332 lbs. But these special adaptations are not accurately understood by any farmer, and are only approximately understood by a very few. The great mass of them sow such seeds as can be most easily procured, without even a thought of any special adaptation to their own soils, circumstances or wants.

I do not know how many different kinds of maize or Indian corn are raised in the United States, but I have seen nearly one hundred different varieties. It is the same with corn as with wheat. Farmers do not know which of these varieties are most nutritive, or which are the most prolific under given circumstances. Nevertheless they vary greatly in both these respects. The analysis of Dr. Emmons shows that there is 33 per cent. more of flesh-forming matter in the white flint corn than in the Ohio Dent, and similar differences may be found running through the entire list.

These specifications of the ignorance of farmers respecting the matters that it is most necessary they should know, might easily be extended, but I have already said enough to show the enormous losses that are entailed on them as individuals, and upon the whole community at large in consequence of their lamentable ignorance of the first rudiments of their profession.

The only institution organized in the State to meet a want which I have shown to be so vital is the Agricultural College of Cornell University, which could easily accommodate three hundred students, but which actually has about twenty. There are 216,250 farms in the State, and therefore one student of agriculture to 10,812 farms.

This is a very sad showing, and very discouraging to the ardent friends of agriculture. There is no trade or profession practiced by men that involves the practical application of so many branches of science. The farmer cannot understand the origin and nature of the soil he cultivates without the aid of geology; he cannot understand the germination and growth of plants, or the proper application of manures, without a knowledge of both inorganic and organic chemistry. To identify weeds and useful plants he must be familiar with practical and theoretical botany. Insects often ravage his crops; he must learn entomology in order to guard against their ravages. He breeds and rears domestic animals; he needs, therefore, a thorough knowledge of anatomy, physiology and hygiene, if he would reap the largest profits of which the business is susceptible. His processes are mostly dependent upon the weather, and he therefore should be acquainted with the principles of meteorology. In short, there is scarcely a single branch of science that will not be profitable to him in some stage of his operations.

We see the need of special agricultural education, but how shall we account for the entire apathy of the farmer with regard to it? Why do the farmer and his sons reject the aid that is offered to them?

There are, undoubtedly, many distinct answers to these questions, but I believe that the entire exclusion of agriculture from our common schools is one of the causes of the apathy complained of. In our primary schools there is not only elementary instruction given, but a higher knowledge is foreshadowed; curiosity is thus awakened, and desire to possess this knowledge is aroused. The graded school, while it supplies the want, also foreshadows a wider range of knowledge which is supplied at the academy, and the academy in its turn foreshadows and excites a taste for the higher knowledge taught in the university. It is this hierarchy of schools that excites the desire for knowledge, as well as affords the means of gratifying it. If there were no seminaries intermediate between the common school and the university, the number of students in the latter would be very small.

I see no other way to fill up the present agricultural college, and to promote the establishment of new ones

in different parts of the state, but to resort to the same system. The sons of our farmers must be taught in the common schools that there is such a thing as agricultural science, which is of great practical utility. and some specimens of this science should be interwoven into the course of study. This should be extended in the course of instruction at the academies, and in this way the sons of farmers would be led to seek for the complete course of agriculture provided in the agri·ultural college.

Some years ago, an admirable little manual of agricultural chemistry was prepared by the late Professor Johnson, of Edinburgh, and was reprinted in this country, which would form an admirable basis for the teaching of agricultural chemistry in our common schools. All the apparatus required for performing the experiments described in it can be purchased for twenty dollars. Two short lessons a week, illustrated in a lecture from the teacher, of about ten minutes in length, would take the pupil through it in a year. Of course it is very elementary, but the boy will get some real and fruitful ideas of the more important alkalies, earths, acids, and of their behaviour in each other's presence; and what is still more important he will get glimpses of problems beyond the book, which will excite his curiosity and make him anxious to acquire a fuller knowledge when he is transferred to the academy.

Half a day in summer could be profitably devoted by both teachers and scholars to gathering all the varieties of grass and grain that grow in the neighborhood. These should be illustrated from time to time in short ten minute lectures, and the specimens preserved in cabinets kept in the school-house for that purpose.

Once in each summer month the teachers and scholars should make an excursion into the fields and woods, to collect the insects of the vicinity, which should be named and preserved in the school-house, and similarly illustrated by short occasional lectures. Collections of geology should be made and illustrated in the same manner.

Of course the scholars would get but a slight elementary knowledge of these matters from such instruction, but the initial step would be taken, the seed would be planted, and there are good reasons for believing that it would bear fruit an hundred fold.

The work thus commenced in the common school should be carried on still further in the academies. Their museums of agriculture should be much fuller, including all the plants of the county, specimens of all the timber trees and their seeds, of the rocks and fossils of the county. the various kinds of mineral manures in use, models of the more important agricultural implements, and wax models of the fruits which the young ladies, ingenious in wax work, would be glad to supply if they knew that they would be valued and preserved.

A pretty full course of lectures on organic chemistry, botany and economic geology, and on entomology with reference to agriculture should be given annually, and the whole course of the teaching should be directed to the cultivation of habits of attention and observation.

If this course were adopted in our common schools and academies, the Agricultural College of Cornell University would not only soon be filled to overflowing, but other similiar institutions would be imperatively required in every section of the State.

When the young farmer is thus prepared to enter upon his career, by a thorough knowledge of all the collateral sciences, there will soon follow a vast augmentation of our crops and revenues, the average production of our fields will rise to the level of maximum production, and all the sources of our civilization will be elevated is a corresponding ratio.

SHEEP BREEDING.

BY HON. GEORGE GEDDES.

(From the *New York Tribune.*)

In treating of the branch of sheep husbandry that comes under this head, I must necessarily discuss points and principles that are applicable to the rearing of all farm stock. I must draw some of my facts from the experience of cattle breeders; and, necessarily, a considerable part of my paper must be deductions from facts, and thus fairly be considered as theoretical; and so far as my opinions may be fairly classed among the things that have never been established beyond all doubt by actual trials, I shall offer them with becoming diffidence, and with a full knowledge that many able thinkers entertain different opinions in regard to the leading principles that should govern the breeder of domestic animals, and I shall welcome any one into this important field of inquiry, whether he may agree with me or not, if he will only add the least amount of light where there is so much darkness that it is desirable to dispel.

Differences of Opinion.—The most important difference of opinion among breeders is in regard to the degree of consanguinity that is admissible between the animals that are to be paired together. From time beyond which neither tradition or history can be traced, among most nations there has existed an opinion that near relatives should not marry; and the notion is nearly universal that the children of cousins are apt to be imbecile in body and mind. Facts are constantly quoted to sustain this opinion, and so facts in abundance are produced to show that these defects of body or mind are no more common to the children of cousins than to the children of parents having no blood relationship; and so confident are the parties that deny the injurious results following the marriage of cousins, that we see such marriages very frequently, and especially in what are sometimes called the higher walks of society Perhaps it would be better to say that the more effete classes, by the luxuries that wealth has given a few generations, have lost that vigor of constitution necessary to a perfect reproduction of their species. So, from all that has been said and written on this point, it would now be very difficult to say what is and what is not established in regard to the facts.

Some physiologists have attempted to dispose of this conflict of facts by saying that the qualities of parents do not descend to their offspring in equal degrees, as would be indicated by a mathematical statement of a pedigree. They say that brothers of the full blood often are so unlike in all their structures, both of body and mind, that no one unacquainted with their origin would suspect from their appearances that the least relationship existed, and that first cousins, who mathematically estimated, have one-half of their blood alike, may in fact have inherited from the different lines from which they have descended organisms very unlike each other. In the case of brothers, one may resemble the family of the common mother, and the other of the father. Cousins that have inherited constitutions from such of their parents as were not by blood related in the least, such reasoners say, may be properly married, as really they are not constitutionally related at all.

This is theory, but it is a theory founded upon a vast array of facts, that to many men make proof as strong as Holy Writ. So deeply is this opinion founded, even in the common mind, that the term "takes back" has come into general use to express the idea that men and the lower animals often resemble the grandparent or

great-grandparent more than they do their own immediate progenitors Now, in cases where one brother "takes back" to one grandfather, and the other brother to another, they may not resemble each other at all, as measured by the eye of a stranger. But the children of these brothers may in turn so "take back" that the daughter of the one may resemble the same ancestor that the son of the other resembles. When this happens these reasoners say that such parties should not be mated. Admitting this theory to be well-founded, it follows that the breeder of domestic animals should possess a very exact knowledge of the animals he is handling, and that he should have in his mind a very well settled plan of operations, and a standard of excellence toward which he is aiming. He should know the whole history of his breed, or family, of animals, and what it was before any systematic plan of improvement had in any respect changed it from the condition in which it originally existed, and a knowledge of all the changes that have been made during the time in which improvement has been going on.

Breeding "in-and-in," as the mingling of the blood of animals nearly related is termed, has been resorted to by all the great improvers of domestic animals. They were forced to this, because, having procured the best animals of their kind, they were obliged to breed their posterity together or breed them with inferior animals. The well recognized law that within certain limits "like produces like," requires that the standard toward which the breeder is aiming should never be lost sight of, and uniformity (not crossing of things unlike each other, except as changes to correct defects are desired) being constantly aimed at, there is no option, and the breeder must keep within the family, and this is but breeding "in-and-in," more or less. Bakewell in England, and Hammond of Vermont, bred their sheep in the closest manner. I believe Mr. Hammond did not pay the least regard to the relationship of the animals he paired together. The origin of the famous "improved" shorthorn Durham cattle gives us instances of the most extreme breeding of this kind of which we have any knowledge.

The results, so far as I have been able to learn them, of this close-breeding, all teach one and the same lesson, and that is, that persistence in breeding in-and-in can only be successful in the most skillful hands. A single case or two will, perhaps, do well enough in anybody's hands, but, by-and-by, in-and-in breeding ruins every herd that is not in able hands. An authority says on this point:

"Inter-breeding in such close relations is a nice—possibly a hazardous—thing, and can only be practiced by experienced men, who are good physiologists, have a just appreciation of both the good and indifferent qualities which their cattle possess, and the knowledge how to couple them together to produce favorable results."

By in-and-in breeding we concentrate the blood, and avoid, in the progeny, the tendency to "strike back" in anything but a uniform manner, by lessening the number of the ancestors. This idea is expressed very clearly in an essay of Mr. T. S. Humrickhouse, of Coshocton, Ohio, who says:

"If there be any advantages arising from having placed in the line of the direct ancestry, near and remote, a great number of approved individuals, both male and female, it follows that there must be far greater advantages arising from having the same one individual—if he be of marked superiority—placed the greatest possible number of times. . . . . Then, under the operation of the principle of atavism (ancestral excellence or peculiarity), the chances that the resemblance of such unequaled ancestor will be obtained must be in the ratio of the number of times he occurs in the ascending lines."

If these views are correct, we see how ruinous to a flock one diseased animal will prove if his use is continued. A perfectly sound constitution, free from any taint of disease to be transmitted, is absolutely required if the blood is to be concentrated by in-and-in breeding.

What is to be done by the flock-master when he has discovered some transmissible disease appearing in his flock? He must at once resort to outside blood that will counteract this injurious tendency. Fortunately, in the Merino sheep, there is no difficulty in finding pure blood, on various soils and in various climates, that has been subjected to such a vast variety of treatment, that though once belonging to the same stock, constitutional tendencies have become so unlike that the means are within reach of such breeders as are themselves qualified to select the proper animals to correct any wrong tendencies that they may have discovered in their flocks. Skill on the part of the breeder is required, and, having knowledge of what he wants, he is able to find it But if he have not that knowledge, who can help him?

The objection sometimes made to breeding from animals nearly related, founded on the law given to the Jews to regulate their practices among themselves, will have little weight if we but consider that though these laws may have had some foundation in physical considerations, they were evidently founded more on the proximity of the relationship by affinity than by consanguinity Their principal object evidently was to preserve the purity of the family circle. The marriages of men and women can never be governed by pure scientific principles, and man is something more than an animal, and something more than mere body is to be produced in his case. On the other hand, domestic animals are to a very considerable extent, as they now exist, artificial and of man's creation; bred, fed, killed, for his profit, as to him appears good.

To sum this matter up: Improvers of breeds of sheep, as well as other domestic animals, will be forced more or less to breed in-and-in. These improvers should furnish the stock rams for the great mass of flock-owners, because they can furnish better rams than unskilled flock-owners can breed; and, making the improvement of sheep their business, they can raise the stock rams at less cost than can common flock-owners, and rams thus produced will greatly improve the common flocks into which they may be introduced. Thus the comparatively unskilled man finds that by drawing his stock rams from better flocks than his own, he is constantly improving his flock, and he is doing this at less cost, and with greater rapidity, than he can in any other way

The breeder of rams may have an animal that, because he is a little, and only a little, better than any man else can show, is for this reason nearly priceless to use in a flock that approaches this paragon in excellence, while he would not be worth, to the owner of an ordinary flock, very much more than his brother, that comes a little short of him in some point of excellence. So it does not follow because breeders of rams for others to use are willing to pay each other large sums for very choice animals, and are fully justified in so doing, that the owners of common flocks should pay for second-rate rams very large prices.

There are in any business only a few men who are masters—the great body are followers. Only now and then will a breeder of stock rams be so successful as to make the business very much more profitable than keeping an ordinary but improving flock. The few that do succeed, and make a mark, do the public much more good than they do themselves, however rich their reward.

In the older States there will for a long time be

many advantages for improvement that will inure to the keepers of small flocks of choice sheep, that will not be possessed by flock-owners of the new States, and I think that for a long time to come the owners of large flocks in the far West will find it for their advantage to look to the East for their stock rams. I believe that vast quantities of clothing wool are to be produced, in a not very remote future, west of the Mississippi, and that this wool is to owe its best qualities to the rams that are bred near the Atlantic Ocean.

All improvers of domestic animals, I believe, are sticklers for what is called pedigree, which is simply proof of unbroken descent in all the quarterings from some admitted pure stock. This is a very general definition, and does not cover all the ground that is in the mind of a breeder. He will require a history of the particular line through which any individual has descended, so that purity of blood is not all that is held of value in a pedigree. It is the one thing that must belong to all pedigrees of thoroughbred animals, but much more than this is required to make an animal bring the highest price. This point is well shown in the market prices of the improved Short-Horn Durham cattle. There are thousands of animals whose pedigrees can be as perfectly traced to the common ancestry as can be that of the Duchess family—that, just because they are not of that particular family, sell for hundreds of dollars, while could they but show that they were sufficiently strong in this most-esteemed Durham blood, would bring thousands. This may appear absurd and unreasonable to persons who have not considered the whole subject, but the men who make these distinctions, and prove their sincerity by paying their money, say that the Duchess family has for so long a time produced the very best of animals, as determined by trials in England and here, without anything like the ordinary percentage of second-rate ones, that their progeny are certain to be first-rate, or so nearly so that their value is really as great as the market price indicates. The advocates of in-and-in breeding constantly cite this family as the best of proof that by close breeding this great excellence is obtained—and certainly no person who knows the history of this family of Durhams will pay their market value unless he is a firm believer in the closest breeding.

The Duchess family has been bred so closely that it may be said, with almost literal truth, that the nearest relations have been mated without any hesitation on that account, as long as their ability to procreate continued—breeding a bull to his own sisters and daughters, and grand-daughters, and so down.

The fact is undisputed that the bulls of this Duchess family produce the most marked improvement upon other families of the Durhams, and in this fact lies a large part of their selling value. This ability to make their mark is believed to be due to the fact of their having descended from the close breeding I have stated. Individuality has been intensified, and however the progeny may "take back," it can hardly fail to resemble and inherit the good qualities of the family as it now exists. The owners of thoroughbred females that are not of this particular family pay largely for Duke bulls, as the intensity of their blood is supposed to be able to prevail over the blood of families less closely bred in-and-in. Owners of ordinary, or so-called native cattle, have not the same reasons for paying a very high price for a Duke bull, as any well-bred short-horn Durham bull will have strength of blood to prevail over the mongrels and cross-bred cattle.

This opinion that the Duke bulls make more impression than ordinary full-bred animals has a parallel in the rams that have been bred by some of the principal improvers of sheep. They have been close in-and-in breeders, and the rams thus produced have made great improvement on the flocks with which they have mingled. Though the ewes were equally full blood of their breed, yet these close-bred rams have, in very many cases that have come under my observation, stamped themselves, so far as form of body and weight and value of fleece is concerned, in a most marked manner. While I say this in regard to the males of these close-bred flocks, I must say that, so far as I have been able to get at the facts, the females of these flocks have not proved to be of especial value as breeders in the hands of persons who have introduced them into their flocks.

We have no Herd book, or Flock book, in which to record the pedigrees of our sheep, as have the cattle men for their stock; so it has come to pass that the name of the breeder has had to take the place of a recorded pedigree among the sheep men. A breeder of Durhams does not particularly inquire as to who has bred any particular animal; but, rather, he looks over the Herd book, and carefully studies the pedigree there recorded; while it very often happens that the selling value of a good looking ram—that has not been tried as a stock-getter—depends very much on who bred him. Is not this an unconscious testimony in favor of in-and-in breeding?

Useful as pedigree is in determining the value of an animal as a stock-getter, there is yet something wanting until he has been tried and his qualities proved. Some animals have a greater power of transmitting their own qualities than others, even of the same breeding, and this fact can only be ascertained by actual trial.

ATAVISM [from the Latin *atavus*, ancestor].—"The recurrence of any disease or peculiarity of an ancestor, after it has been intermitted for one generation or more; also, the recurrence of the original type of a species in the progeny of its varieties." I have given this definition of Webster of a new word, that the scientific men use, to convey nearly the same idea that the less learned express by the words "take back." This definition takes for granted that organisms are not inherited in mathematical proportions from ancestors. Prof. James Law, of Cornell University, says that this "Atavism, reversion, or breeding back, is another and troublesome cause of variation. Its operation is seen every day around us. A child resembles not its own parents, but its grandparents, great-grandparents, or more remote ancestors, alike in form, features and habits. The Galloway, Suffolk and Angus cattle, which have been black and hornless for 100 or 150 years, occasionally produce a brown or white calf which grows horns;" and he goes on in his lecture, on the principles of breeding domestic animals, delivered before the New York State Agricultural Society, to give many instances of this atavism, which go to show that, "though such reversion will sometimes occur without any apparent cause, it is more frequently induced by some change in the conditions of life;" and that animals allowed to run wild are inclined to revert to their original type, and that violent crossing between two races of strongly fixed types also tends to reversion, and he gives several cases to prove this.

The sum of the whole of this matter is this: An old and pure breed of animals has a fixed type that it nearly always preserves among its own members; though sometimes an animal will appear that shows some uncommon points, that are only to be accounted for on the principle of atavism, that reach away back to the founders of the breed; but the older the breed is, the stronger the blood, and the less frequently these cases of variation occur; and that breeding in-and-in aids in intensifying the blood, and lessens the chances of this reversion to old and forgotten ancestors. So it appears that a pedigree that reaches back many centu-

ries, and in which there has been much close breeding, gives assurance not only of uniformity of type in the future, but guarantees the ability to rapidly change into its own likeness any less ancient branch of its own race of animals with which its blood may be mingled.

Having stated these advantages of in-and-in breeding, I feel called upon to warn my readers against rushing too fast into these deep waters, for there are perils to be encountered even here, and none but the most skilled navigators fail sooner or later in being stranded on the rocks.

In my own experience in breeding sheep, I have never followed the in-and-in line of breeding quite to the breakers, but with Durham cattle I have continued so to breed until sterility was the result, and I was obliged to resort to comparative plebeian blood to get calves. With cattle, I have seen rheumatism and scrofula follow close breeding that was, in my judgment, intensified by it. It is manifest that, whenever any disease that can become constitutional and hereditary appears, the animal that is the subject of it must no longer be mated with its near of kin, for the same taint, though it may not yet have revealed itself, probably lies dormant in the other members of the family. At once new blood, though it may be considered, for ordinary use, of a lower grade, must be introduced. "Mr. Bates, so celebrated in connection with his strain of short horns, says that, 'to breed in and from a bad stock is ruin and devastation; yet, that the practice may be safely followed within certain limits, when the parents so related are descended from first-class animals.'"—(Prof. Law.) And this distinguished improver of short-horns, after having from 1804 to 1831, twenty-seven years, bred entirely within his own herd, was forced to go out of it, and buy "Belvedere" from another herd, but of the same original blood ("American cattle," page 208); and Belvedere not only stopped the downward course of Mr. Bates' herd, but carried its fame to the highest point. By adopting the wise policy of Mr. Bates, "by introducing at intervals blood of the same breed, but of a different branch of the same family, which has been bred apart for several generations, and, if possible, on other soil and exposure, we can secure all the good of close breeding, and at the same time avoid its dangers."—(Prof. Law.)

In the management of flocks of sheep some of the most noted breeders have kept distinct families that crosses within the same blood might be had at home. Jonas Webb, the well-known improver of the Southdowns, "found it needful to keep five different families to draw upon, thus retaining the requisite distance of relationship between the sexes."—(Prof. Law) The famous Silesian sheep of Mr. Chamberlain originated from 100 Infantado ewes, purchased in Spain in 1811, by Ferdinand Fischer, who at the same time purchased four rams from the Negretti flock, and never mixed with these sheep any other blood, nor any other flock, but they have been crossed within the families. "The mode is to number (by notches in the ear) every sheep, and give the same number to all her increase; an exact record is kept in books, and thus Mr. Fischer (a son of the first owner) is enabled to give the pedigree of every sheep he owns, running back to 1811."—(Randall's Practical Shepherd, p. 89.) So Mr. Fischer has 100 families, every member of which is fully recorded in books, that Mr. Chamberlain saw, and that he has told me, filled many shelves. In this way the breeder has availed himself of the advantages of in-and-in, as well as cross-breeding, among 100 families, all within the same breed, and all of equally pure blood.

From what I have said in regard to the successful breeding, not only of sheep, but other domestic animals, I think it must be plain that vast knowledge and uncommon natural gifts of judging are necessary to success, and we cannot wonder at the respect that the great improvers have had shown to them by the highest ranks in England, and we think the queen did herself honor, when on a show-ground, she asked a noted breeder of Devon cattle to instruct her as to his views of the points to be aimed at.

Having pointed out some of the advantages and dangers of in-and-in breeding, I wish to close by stating the only case that occurs to me, in which there is nothing but plain sailing, and where the novice may fearlessly venture:

In the South-West and West, and perhaps elsewhere, there are many large flocks of what are called native sheep, whose wool is so thin and poor that the animal is of but little value except as furnishing the foundation of grade flocks, which, though not as good as full blood Merinos, are still of great value. On these ewes, Merino rams may be put, and the same rams put to their progeny, daughters, grand-daughters, great-grand-daughters, and so on as long as they live. The only condition requisite is, that the ram should be of the best quality, and be a getter of good stock, and I should prefer to have his pedigree show that he was from a family closely bred in-and-in, till his blood had become greatly intensified, without having approached or shown any signs of disease or degeneration in the flock. A ram from a flock that for many generations had been handled after the plan of Mr. Fischer should have constitution enough to make a great impression on mongrel blood, and I am satisfied, from what I have seen of breeding sheep, that such a ram might be safely used in such a flock and among his own descendants there, as long as he may live, and I believe that under parallel circumstances, a Duke bull may be used in the same manner. Having procured half-bloods, and three-quarters, and seven-eighths, and higher grades still by the use of the same male, never commit the folly of breeding these grades together, but continually resort to the flock or herd, toward which you wish to breed, for sires, and always procure full-blooded animals. And in selecting them aim to resort to such sources as have not only produced the individual you want, but that have produced many more like him. Skill in selecting, so as to cure defects, will, at all stages of breeding be important, and that skill can only come from experience. Books may aid, but practical knowledge must be had, to enable the student to duly understand what may be written by the most skilled flock-master. If I have written so as to aid the beginner in acquiring practical knowledge on this difficult branch of sheep husbandry, then have I accomplished all that I hoped for when I commenced.

THE FARMERS' PROGRESS.

(*N. Y. Evening Post*, Aug. 17.)

Our increase in all the chief articles of agricultural produce, as shown by the census report, is something enormous.

Wine has increased fourteen fold since 1850, and nearly doubled in the last decade, California being its chief producer.

Hops have increased seven fold in the same time, and more than doubled in the last ten years, New York growing two-thirds of the whole crop.

Barley has increased six fold.

Flax six fold, and flaxseed treble.

Wheat trebled and oats doubled.

Irish potatoes have only increased one-third, and sweet decreased one-half.

Live stock have trebled in value, and now amount to the handsome total of one thousand five hundred and twenty-five millions of dollars, or an average of nearly two hundred dollars for every family in the nation.

Animals slaughtered have nearly quadrupled in value, now amounting to four hundred millions of dollars annually.

Wool has increased from sixty to one hundred millions of pounds.

Cotton is half a million of bales above what it was in 1850, and three-fifths of its amount in 1860.

In only one instance is there a decrease of an important product, and that is in Indian corn, which falls short of the amount reported in 1860 by seventy-eight millions of bushels, or ten per cent. of the whole.

In some of the lesser products, however, the downcome is considerable. Silk cocoons are only a third of their former amount, hemp a sixth. peas and beans and rice about a third each. Buckwheat has decreased from seventeen millions of bushels to nine, and rye from twenty-one millions of bushels to sixteen.

The farms themselves, as may be expected from this great increase of produce, have risen in value from three to nine thousand millions of dollars, while farming implements. valued in 1850 at $151,587,638, now foot up $336,878,429, an annual increase of nine millions of dollars. Few minds can form even the remotest conception of what these numbers imply. The value of the farms in dollar bills would take an expert accountant, capable of getting over one hundred a minute, five hundred years to count them, or if Communists and Internationals had their way, and their value was divided equally among the whole people, it would afford $1,000 to each family, in addition to the million or two which would be sure to stick to the hands of the dividers.

The farms have considerably increased in number, but diminished in size, from 199 to 153 acres, being on an average fifty acres, each, less than in 1850. This decrease extends to every State in the Union save four: Arkansas, Massachusetts, New Hampshire, and New Mexico. Of the present number of farms (2,659,485) 6,875 are under three acres. Those with more than 10 acres and less than 500, have increased, those with less than ten acres decreased in number; one-sixth of the whole are over 100 acres and under 500, but the largest number (847,614) contain between 20 and 50 acres

In France the extension of railways is said to have had the effect of shifting much of the wine product to those districts best adapted to the purpose, and most convenient to market. With us a process at least in part the reverse seems going on. Great exertions have been made from time to time, and much money expended, to get flax culture localized as an industry in New England and some of the Middle States, where the land for its product is of the best description, and facilities for market all that could be desired. But it could not be done, and it is now rapidly disappearing from those States that took most care to extend and keep it. and going West, to where the land is not better, if so good. for the finer qualities, and where the best part of the product—the fibre—has to be thrown to the manure heap for want of a market There it is extending with surprising rapidity, apparently without special effort on the part of any one to get it to do so.

Twenty years ago Kentucky supplied nearly a third of all our flax product; Virginia and New York about a million of pounds each, making up together as much as Kentucky; and Ohio supplied less than half a million of pounds. But now Ohio has nearly forty times its former product, while Kentucky has only a tenth of its, and Virginia has gone down to a seventh. The chief flax producing States are Ohio, 18,000,000 of pounds, or two-thirds of the whole product of 27,133,039 pounds (the product in 1850 was only 7,209,676 pounds) New York, 3,000,000 and Illinois 2,000 000; while New England, with the exception of a little in Maine and Vermont, may be said to have ceased to be flax producing; as have also Alabama, Delaware and Georgia.

New York has now, as hitherto, about a sixth of the whole milch cows of the nation; and used to occupy a similar position as to working oxen. but now Texas has twice the number it can show. California has increased its sheep from 17,574 to 2,768.187, being an increase of 160 fold, and the largest made by any State in any important article. Louisiana still grows nearly all the sugar, but the pigs have changed their headquarters from Tennessee and Kentucky to Illinois and Missouri. Pennsylvania, which used to be highest in the production of wheat, is now sixth on the list, Illinois with 30, Iowa with 29, Ohio and Indiana with 27 each. and Wisconsin with 25, all coming before its 19 millions of bushels.

The agricultural position of New England is a puzzle which Œdipus himself could not unravel. A people in the foremost rank for intelligence, force and good sense, more bent usually than most others in doing the right and the best, when opportunity offers; taking time by the forelock and not putting off till to-morrow what can be done to-day; having before them line upon line, precept upon precept; supported by experience on experience as to the possibility, propriety and advantage of very greatly increasing their agricultural product at little or no increase of trouble, they stand face to face with a deteriorating position, with bountiful Nature ready to increase her product to almost any amount and put millions of dollars in their pockets, but they don't put forth a hand to help her, or show any desire to be the recipient of her increased bounty.

They are content to go on year after year with every important crop decreasing in amount. Wheat, corn, oats, sheep, butter, swine, flax, wool and potatoes, all "getting smaller by degrees," and not "beautifully" but miserably "less;" with even the bees—the prototype of their former activity, as if ashamed of the situation, leaving them, and honey and wax becoming a diminishing product. The only item in which New England has any credit, during the last decade, is cattle, of which there is a large increase, both in the value of the slaughtered and the live stock; to this Connecticut adds a large increase in tobacco, not exactly the direction in which we should expect "the land of steady habits" and utilitarian projects to be most progressive. The increase of manufactures will not put money into the pockets of the farmers unless they have something to sell; but, going on as they have been, their bread products will soon hardly suffice for their own families, and New England, agriculturally will be like a withered branch on a fruitful tree, or a sluggard's field brought into bold relief by contrast with its neighbor, New York—active, energetic, progressive, always excelling in the most useful and best paying products, and those especially which New England is so much neglecting.

With their brains and money there is no excuse for the people of New England occupying such a position. But a little effort and change of system is needed to make this country a beautiful garden, affording, in richest abundance, the choicest and most desirable products, and they owe it to themselves and the nation, but especially to the high character of New England in other respects, to make their agricultural system also excellent, and thus get in accord with the rest of the nation and with themselves in other and even less important particulars.

NOTICES AND DONATIONS.

The following volumes of Transactions of the New York State Agricultural Society, have been received:

From Richard Church, Belvidere, N. Y., 3 copies for the year 1859, and 1 copy for the year 1860.

From Dr. E. G. Crafts, President of the Broome County Agricultural Society, 4 copies for the year 1868.

From Edwin Thorne. Millbrook, N. Y., 1 copy each for the years 1844, 1849, 1851, 1852, 1853, 1855, 1856, 1857 1859, 1863 and 1864, and 3 of 1845, 2 of 1858, and 3 of 1868.

From Horace S. Huntley, Little Valley, N. Y., 1 copy each for the years 1857, 1858, 1859, 1860, and 3 of 1861.

From J. M. Lattin, Rhinebeck, N. Y., 1 copy for the year 1861.

The following Seed Catalogues for 1872, have been received:

From B. K. Bliss and Son's, No. 23 Park place, and 20 Murray street, New York city.

Hovey & Co., 53 North Market street, Boston, Mass.

Vilmorin-Andrieux & Cie., 4 Quai de la Megisserie, Paris, France.

R. H. Allen & Co., 189 and 191 Water street, New York city.

C. W. Crosman, Rochester, N. Y.

J. M. Thorburn & Co., 15 John street, New York city.

Also the following miscellaneous pamphlets, etc.:

Thirtieth Annual Report of the Transactions of the Queens County Agricultural Society, for the year 1871.

Journal of the National Academy of Agriculture, Manufacture and Commerce, and of the French Society of Universal Statistics, November and December, 1871, and January, February, March, andApril, 1872. Paris.

Bulletin of the National Association of Wool Manufacturers. October, 1871. No. 7, vol. 2, and January—March 1872, No. 1, vol. 3. Boston, Mass.

The Illustrated Annual Register of Rural Affairs for 1872, Luther, Tucker & Son, Albany, N. Y.

Transactions of the Hampshire Agricultural Society, for the year 1871. Amherst, Mass.

Eighth Annual Report of the Trustees of the Massachusetts Agricultural College, January, 1871.

Historical Address delivered before the Massachusetts Agricultural College, July 19, 1871, by Marshall P. Wilder.

Catalogue of the Officers and Students of the State Agricultural College of Michigan, 1871.

Models of 24 varieties of apples, from Charles Downing, Newburgh, N. Y.

Address to the Agricultural Organizations in the United States, prepared by the National Agricultural Associations, with Constitution and Proceedings. Nashville, Tenn.

Catalogue of the Kentucky University for 1871; also the Annual Report of the Treasurer of Kentucky University. Lexington, Ky., 1871.

Ninth Annual Report of the St. Louis Agricultural and Mechanical Association. St. Louis, Mo.

Third Annual Report of the State Board of Agriculture of Nebraska, 1871.

Seventh Annual Report of Rutgers Scientific School for the year 1871.

H. H. Ingalsbe, South Hartford, N. Y., Ingalsbe & Prescott's Champion Tree Pruner, for the Museum.

Report of the Commissioner of Agriculture on the Diseases of Cattle in the United States. From the Hon. Commissioner of Agriculture, Washington, D. C.

Central Agricultural Gazette of Germany, Nos. 9, 10, 11 and 12, 1871. Berlin.

Session Reports of the Mathematical-Physiological Class of the Royal Bavarian Academy of Science, vol. 1 and 2, 1871.

Also "The Problem of the Study of Chemistry in opposition to the requirements of Science and Technology," an address by Dr. Elenmeyer, from the above Society.

Bulletin of the Imperial Society of Naturalists in Moscow, Nos. 3 and 4, 1870, and Nos. 1 and 2, 1871; also the Recent Memoirs of the Imperial Society of Naturalists in Moscow, No. 3, 1871.

Catalogue of the Library of the Imperial Society of Natural Sciences in Cherbourg, France, 1st part, 1870.

Nineteenth Annual Report of the Council of the city of Manchester on the Working of the Public Free Libraries, 1870-71.

Third and fourth Annual Reports of Flax Extension Association for the improvement of the culture of flax in Ireland, also Instructions for the culture and preparation of flax in Ireland. Michael Andrews jun., Secretary, Belfast.

Catalogue of American and Miscellaneous Books for sale by Edward W. Nash, 120 Nassau street, New York.

List of premiums awarded at the Oregon State Fair, 1871.

From A. S. Fuller, Sections of the Larix Europea, (European Larch) showing the advantages of cultivation.

Journal of the Société Centrale d'Agriculture of Belgium, January and March, 1872. Brussels.

From Francis H. Appleton, West Peabody, Mass., Transactions of the Essex Agricultural Society in Massachusetts for the year 1871.

Three copies each of the Transactions of the Iowa State Agricultural Society for the years 1859 and 1860, from J. M. Shaffer, Sec'y.

Descriptive Catalogue of live stock for sale by A. B. Allen & Co., 189 Water street, New York.

Thornton's fifteenth Circular. A Record of Short-Horn Transactions and Catalogue of Short-horn cattle for sale. January 1872. John Thornton, 15 Langham place, London, W.

Transactions of the Vermont Dairymen's Association, 1870-71, Georgia Vt., from O. S. Bliss, Secretary.

Annals of the Lyceum of Natural History of New York, Nos. 4 and 5, vol. 10.

Monthly Reports of the Department of Agriculture for February, March and April, 1872. Washington, D.C.

Nineteenth Annual Report of the Mercantile Library Association of San Francisco, California, 1871.

Illustrated Catalogue of the Museum of Comparative Zoology at Harvard College, No. 5. The Immature State of the Odonata, part 1, Sub-family Gomphina; by Louis Cabot.

Report of the Secretary of the Iowa State Agricultural Society for the year 1871.

Proceedings of the Boston Society of Natural History, pages 113 to 224. Vol. xiv, 1871. Boston, Mass.

Transactions of the Highland and Agricultural Society of Scotland. Fourth Series, vol. 4, Edinburgh, Scotland.

Report of Charles H. Peck, Botanist of the New York State Cabinet of Natural History, 1872.

Transactions of the Massachusetts Horticultural Society for the year 1871. Boston.

Seventh Annual Report of the American Dairymen's Association for the year 1871. Syracuse, N. Y.

Premium List of the Third Annual Texas State Fair to be held in the city of Houston, beginning May 11, and ending May 18, 1872.

Journal of the Societa di Letture e Conversazioni Scientifiche, volume 2, part 2. Genoa, 1871.

Agricultural Gazette of the Prussian Provinces, Nos. 26 to 52, 1871. Konigsberg.

Profitable Farming. being the second series of the sayings and doings of John Joseph Mechi. From the author.

From the Department of Agriculture, Washington, 16 quarts Red Mammoth Wheat. 16 quarts Birlie Oats, and a number of papers of flowers and vegetable seeds for experiment.

Second Annual Report on the Noxious Insects of the State of Illinois, by William Le Baron, M D., State Entomologist.

The Cornell University Register, 1871-72. Ithaca, N. Y.

The Baltimore Process of Progressive Pneumatic Evaporation. Marshall P. Smith, Baltimore. Md.

Annual Report of the Trustees of the Museum of Comparative Zoology at Harvard College, together with the report of the director for 1871.

Fifteenth Annual Report of the Wilmington Institute April 1872. Wilmington Del.

Premuim list of the Iowa State Agricultural Society for the 19th Annual Exhibition to be held at Cedar Rapids, September, 9, 10, 11, 12 and 13, 1872.

Catalogue of the Journals and Reviews in possession of the Societa di Letture e Conversazioni Scientifiche of Genoa, 1872.

Twenty copies of the Nineteenth Annual Report of the Secretary of the Massachusetts State Board of Agriculture, for 1871. C. L. Flint, Secretary.

Catalogue of Pure-Bred Shorthorns, and Thoroughbred and Trotting Horses, to be sold at auction, by W. T. Hughes and W. H. Richardson, at Elkton, Ky., June 27, 1872.

Catalogue of Trotting Stock, belonging to Edwin Thorne, Thorndale Stud Farm, Millbrook, N. Y.

From J. M. Shaffer, Secretary Iowa State Agricultural Society, Transactions of the New York State Agricultural Society for the years 1860 and 1864.

Premium List for the Queens County Fair, to be held near Mineola, L. I., September 25, 26 and 27, 1872.

A paper on the Principles affecting Cultivation, Manuring and Cropping, read before the Farmers' Club, London, May 6, 1872. By Mr. J. J. Mechi.

Catalogues and Circulars of the Publications of Lee & Shepard, Boston.

Book Circular of Wm. Wesley, London, Eng.

Sixth Annual Report of the American Society for the Prevention of Cruelty to Animals, 1872.

On the Varieties, Properties and Classification of Wheat, 1872. By John Le Couteur, Esq., Jersey. From the Author.

Annals of Agriculture in the Royal Prussian States. Weekly edition, Nos. 27 to 52, 1871. Monthly edition, Nos. 7 to 12, 1871; Berlin; through Dr. Flügel.

Transactions of the K. K. Zoologish-Botanischen Gesellschaft in Vienna, for the year 1871.

The Reason for the Laws for the Protection of Birds, by Georg Ritter von Frauenfeld; also The Rearing of Young by Animals, by the same author. Vienna.

Upon the Wheat-destroying Chlorops tæniopus, Meig. and the means to subdue it; by Professor Dr. Max Nowicki, in Krakau.

Insects Injurious to Cultivated Plants, by Gustave Künstler, Vienna.

Ten copies of the Annual Report of the Commissioner of Agriculture and Arts, for the Province of Ontario, for the year 1871.

From the Secretary of the State Board of Agriculture, Indiana, twelve copies of the Transactions of the Indiana Horticultural Society, 1872; also twelve copies of the Second Report of the Geological Survey of Indiana, made during the year 1870, and twelve copies of the Thirteenth Annual Report of the Indiana State Board of Agriculture.

List of Premiums for the Twenty-third Annual Fair of the Ohio State Board of Agriculture, to be held at Mansfield, September 2 to 6.

Entomological Contributions, from the twenty-fourth annual report of the New York State Museum of Natural History, by J. A Lintner.

Catalogue of A. J. Alexander's Thoroughbred and Trotting Stock, to be sold at Woodburn Farm, June 26, 1872.

A Record of Shorthorn Transactions and Catalogue of Shorthorn Cattle for private sale, for April, 1872. John Thornton, 15 Langham Place, London, W.

Some account of the History and Breeding of the Ayrshire Cattle, imported, September, 1870, by Thomas Thompson & Sons, Dunbar P. O., Williamsburgh, Ontario.

List of Premiums for the twenty-third annual exhibition of the Ontario County Agricultural Society, to be held at Canandaigua, September 18, 19 and 20, 1872.

Premium List of the twentieth Indiana State Fair, to be held at Indianapolis, September, 30, 1872.

From Robert J. Swan, Esq., a copy of the New York State Agricultural Transactions for 1847.

From D. A. Bulkeley, Esq., a copy of the New York State Agricultural Transactions for 1861.

The American Standard of Excellence and Scale of Points in Exhibition Poultry, as adopted by the conventions of the New York State Poultry Society of February and May, 1871.

Proceedings of the Lyceum of Natural History in the city of New York. Vol. I to p. 237.

Premium List of the Oneida County Agricultural Society for 1872.

Premium List of the Georgia State Agricultural Society for 1872.

Report of the Ballarat Agricultural and Pastoral Society for the year ending May 4, 1872. Learmonth, Victoria.

Premium List and Regulations of the Twenty-eighth Annual Fair of the Society of Agriculture and Horticulture of Westchester County.

Proceedings of the National Agricultural Convention, held at Washington, D. C., February, 1872.

Leggat Brothers' Catalogue of Standard and Miscellaneous Books. Nos. 30, 31 and 32.

OFFICERS OF COUNTY AGRICULTURAL SOCIETIES, 1871-2.

COUNTY.	President.	Secretary.	Treasurer.	Post Office address of Secretary.
Albany	H. Callanan	John H. Farrell	D. V. S. Raynsford	Albany.
Allegany	Joseph Lockhart	Frank Brundage	G. S. Arnold	Angelica.
Broome	E. G. Crafts	C. C. Bennett	C. S. Olmstead	Whitney's Point.
Cattaraugus	E. C. Brooks	A. T. Palmer	A. W. Ferrin	Napoli.
Cayuga	J. Lewis Grant	John G. Hosmer	L. C. Mann	Auburn.
Chautauqua	C. Hitchcock	John T. Wilson	D. N. Marvin	Jamestown.
Chemung	A. S. Diven	De Witt C. Curtis	William T. Post	Horseheads.
Chenango	A. W. Holcomb	R. A. Young	G. S. Mead	Norwich.
Clinton	Ira Rowlson	W. J. McCaffrey	J. B. Hagerty	Plattsburgh.
Columbia	Isaac M. Pitts	J. Wesley Smith	Peter Boice	Chatham Village.
Cortland	J. C. Carmichael	C. O. Newton	S. McC. Barber	Homer.
Delaware	Chas. Hathaway	Porter Frisbee	C. A. Frost	Delhi.
Dutchess	Stephen T. Angel	George Sweet	T. W. Jaycox	Washington Hollow.
Erie	P. W. Powers	R. C. Titus	R. B. Foote	Hamburgh.
Essex	P. S. Baldwin	C. E. Stevens	R. J. Ingalls	Westport.
Franklin	James C. Drake	S. S. Willard	M. S. Mallon	Malone.
Fulton	Isaiah Yanney	John J. Davidson	N. P. Wells	Johnstown.
Genesee	Elbert Townsend	G. H. Robertson	A. H. Warner	Batavia.
Greene	Joshua Fiero, Jr	George W. Russ	T. B. Holcomb	Acra.
Herkimer	James H. Bellinger	Morris Fikes	Jacob H. Crim	Herkimer.
Jefferson	Samuel W. Strough	Alvin H. Hall	William Ives	Watertown.
Lewis	A. B. Gebbie	F. J. Bowen	C. G. Riggs	Lowville.
Livingston	J. W. Wadsworth	W. A. Brodie	Kidder M. Scott	Geneseo.
Monroe	A. G. Whitcomb	J. R. Garretsee	L. M. Otis	Rochester.
Montgomery	W. N. Pierson	A. H. Burtch	T. R. Horton	Fonda.
N. York (Am. Ins.)	F. A. P. Barnard	Samuel D. Tillman	S. R Comstock	New York.
Niagara	Elisha Moody	George G. Moss	L. W. Bristol	Lockport.
Oneida	T. D. Penfield	R. Morrison	James Elwell	Clinton.
Ontario	Cooper Sayre	William R. Dryer	William G. Antis	Victor.
Orange	Ellis A. Post	D. A. Morrison	J. W. Corwin	Montgomery.
Orleans	Allen P. Scott	T. C. Bailey	E. R. Reynolds	Albion.
Oswego	M. L. Marshall	H. L. Barton	L. H. Conklin	Mexico.
Otsego	G. P. Keese	H. M. Hooker	Frank G. Lee	Cooperstown.
Putnam	William H. Drew	James D. Little	A. Ryder	Carmel.
Queens	Charles H. Jones	John Harold	John Harold	Hempstead.
Rensselaer	James R. Fonda	H. S. Sheldon	George A. Waters	Troy.
Richmond	T. Sampson	D. Cortleyou	E. P. Barton	Richmond.
Rockland	Isaac Pye	F. J. Wilds	Irving Stevens	Nyack Turnpike.
St. Lawrence	W. G. Barnhart	C. N. Conkey	H. D. Sackrider	Canton.
Saratoga	J. P. Conklin	B. S. Robinson	M. J. Jennings	Greenfield Centre.
Schenectady	Charles Stanford	E. N. Schemerhorn	James W. Mairs	Schenectady.
Schoharie*	Charles Bouck	Isaac C. Van Tuyl	M. N. Denoyelles	Schoharie C. H.
Schuyler	Geo. J. Magee	Jesse M. Lyon	J. W. Smelzer	Havana.
Seneca	John G. King	W. W. Stacey	John D. Coe	Geneva.
Steuben	S. E. Haskins	Reuben E. Robie	G. W. Hallock	Bath.
Suffolk	Henry Nicoll	Henry D. Green	David T. Vail	Riverhead.
Tioga	T. I. Chatfield	Geo. Worthington	S. S. Truman	Owego.
Tompkins	Ezra Cornell	Edgar Brewer	O. B. Curran	Enfield Centre.
Ulster	C. L. Kiersted	Pan Hanlon	F. S. Westbrook	Kingston.
Warren	Henry Griffing	A. Newton Locke	Charles W. Osborn	Glen's Falls.
Washington	Deliverance Rogers	R. W. Pratt	W. M. Holmes	Fort Edward.
Wayne	William R. Rooke	G. T. Kent	D. S. Chamberlin	Lyons.
Westchester	N. Holmes Odell	J. O. Miller	John Bussing	White Plains.
Wyoming	G. H. Jenkins	C. W. Bailey	T. J. Patterson	Warsaw.
Yates		James D. Morgan		Penn Yan.

* Officers of 1871.

OFFICERS OF TOWN AND UNION AGRICULTURAL SOCIETIES AND FARMERS' CLUBS, 1871-2.

SOCIETY.	County.	President.	Secretary.	Treasurer.	Post Office address of Secretary.
Allen Settlement	Broome	A. Marcau	S S. Allen	S. S. Allen	Maine
Annsville and Lee	Oneida	T. Waterman	J. C. Thorne	T. B. Allanson	Taberg.
Bainbridge	Chenango	B. C. Campbell	J. Juliand	J. Juliand	Bainbridge.
Batavia F. C.	Genesee	H. Ives	J. G. Fargo	....	Batavia,
Brookfield	Madison	Winthrop Allen	G. H Babcock	Henry Brown	Brookfield.
Camden	Oneida	S. J. Upson	Ezra B. Cobb	R. Robotham	Camden.
Castle Creek F. C	Broome	Isaac Emens	S. P. Allen	James Gaylord	Whitney's Point.
Cazenovia	Madison	E. P. Tillotson	D. Eagabwadt	C. H. Perkins	Cazenovia.
Central New York F. C.	Oneida	S. Campbell	T. D. Curtis	L. L. Wight	Utica.
Clay F. C	Onondaga	M. H. Blynn	L. Harris Browne	I. Coonley	Plank Road.
Columbia	Columbia	J. W. Hoysradt	C W. Macey	R. B. Shepard	Hudson.
Constantia	Oswego	G. E. Clough	F. C Lander	Jerome Taylor	Constantia.
*Corning	Steuben	H. Goff	F. B. Brown	Q. W. Wellington	Corning.
Cuba Valley Point	Allegany	E. D. Loveridge	G. H. Swift	James A. Story	Cuba.
Danby F. C	Tompkins	Homer Jennings	E. L. B. Curtis	L. C. Beers	Danby.
Delhi	Delaware	D. McMullin	Jonas M Preston	A. M. Paine	Delhi.
East Maine F. C	Broome	A. H. Green	Robert Hogg	Henry Fuller	East Maine.
Edmeston and Burlington.	Otsego	J. C. Chapin	S. C. St. John	F. H. Bilyea	Edmeston Centre.
Ellisburgh, Adams & Henderson	Jefferson	W. Mather	C W. Jennings	Luke Fulton	Belleville. (?)
Elmira F. C.	Chemung	G. W. Hoffman	W. A. Armstrong	S. P. Chapman	Elmira.
Galen	Wayne	M. Mackie	W. H. Peckham	Seth Smith	Clyde.
Garrattsville	Otsego	T. Laidler	W. J. Kellogg	H. C. Potter	Garrattsville.
Geneva Horticultural	Ontario	E. A. Bronson	G. S. Conover	S. N. Anthony	Geneva.
Glen Spring F. C.	Yates	W. W. Mawney	W. W. Buxton	D. H. Clark	Milo Centre.
Gouverneur	St. Lawrence.	George Parker	G. B. Winslow	M. Barney	Gouverneur.
Hamilton	Madison	N. Brownell	O. B. Lord	D. B. West	Poolville
Hammond	St. Lawrence.	J. Ames	C. A. Wooster	C. A. Wooster	North Hammond.
Hemlock Lake	Livingston	J. P. Ray	R. C Beach	W. A. Wemett	Hemlock Lake.
Highland	Ulster	T. H. Burgess	Irving Deyo	C. W. Elting	Highland.
Hume, Rushford, Centreville and Caneadea	Allegany	J W. Cudworth	C. N. Flenagin	G. W. Marvin	Hume.
Ithaca F. C	Tompkins	E. Cornell	L. B. Arnold	G. Benedict	Ithaca.
Kirkland	Oneida	E. Stanton	R. Morrison	J. S. Tillinghast	Clinton.
Lenox	Madison	L. C. Kilham	E. F. Lewis	T. F. Hand	Lenox.
Little Falls F C.	Herkimer	Harris Lewis	X. A. Willard	Josiah Shull	Little Falls.
Manlius and Pompey	Onondaga	David Collin, Jr	Wm. M. Smith	H. Whitney	Manlius.
Moravia	Cayuga	E. Greenfield	M. E. Kenyon	S E. Day	Moravia.
Newburgh Bay	Orange	H. W. Sargent	D. A. Scott	Daniel Smith	Newburgh.
N Y. State Dairymen's As	Oneida	X. A. Willard	J. Shull	D. H. Burrell	Ilion.
Niagara Fruit Grower's As	Niagara	C. L. Hoag	E. W. Gantt	E. Simmons	Lockport.
North Collins & Brant F.C.	Erie	W H. Estes	H. J. Tucker	G. P. Willet	North Collins.
Ogden F. C	Monroe	H B. McClure	C. S. Hiscock	G. W. Hiscock	Spencerport.
Onondaga	Onondaga	W. W. Newman	G. W. Spalding	C. C. Marlett	Onondaga Valley.
Oswego Falls	Oswego	O. Henderson	Arvin Rice, Jr	C. R. Nichols	Fulton.
Oswego Town	Oswego	John L. Thompson,	D. R. Green	S. L. Parsons	Oswego.
Otego	Otsego	W. E Arnold	S. M. Hendrix	L. Coburn	Otego.
Otisco F. C	Onondaga	L. Bowtell	James L Niles	J. H. Redway	Amber.
Palmyra	Wayne	W. P. Nottingham.	C. D. Johnson	C. T. Hyde	Palmyra.
Pomfret	Chautauqua	Ira Porter	A. Z. Madison	A. Z. Madison	Fredonia.
Raquette Valley and St. Regis Valley	St. Lawrence.	C. O. Tappan	H. M. Story	Luke Usher	Potsdam.
Ridgeway	Orleans	J. A. Dermary	James H. Perry	S. Barrett	Ridgeway.
Riverhead	Suffolk	H. L. Hallock	Z. Hallock	S. Tuthill	Success.
Rushville	Yates	C. Olmstead	N. H. Green	I. D. Bryant	Rushville.
St. Lawrence Valley and Fort Covington	Franklin	J. W. Kimball	J. Y. Cameron	C. P. Elliott	Fort Covington.
Sandy Creek, Richland, Orwell and Boylcston	Oswego	Orin R. Earl	D E. Ainsworth	Pitt M. Newton	Sandy Creek.
Sangerfield and Marshall.	Oneida	H. B. Titus	H. M. Rouse	Frank Page	Marshall.
Skaneateles	Onondaga	J. H. Earll	Wills Clift	D. Waldron	Skaneateles.
Spafford	Onondaga	M. P. Monle	S. B. Wallace	Otis Cross	Borodino
Susquehanna Valley	Otsego	C. D. Fellows	W. D. Edson	T. D. North	Unadilla
Thorn Hill F. C	Onondaga	J. McDowell	Allen Brown	M. Mason	Thorn Hill.
Trenton	Oneida & Herkimer	Henry Rhodes	S. Barrows	D. W. Rhodes	South Trenton.
Ulysses, Covert and Hector	Seneca and Schuyler	W. Halsey	S. H. Lamport	J. Parker King	Trumansburgh.
Union Agricultural Soc'y.	Onei'a & Lewis	Job W. Fisk	L. W. Fisk	W. Ray Tanner	Boonville.
Vernon	Oneida	S J. Clark	L. A Griswold	L. A. Griswold	Vernon.
Vienna	Oneida	J. A. Wooden	F. Noble	P. Flanagan	West Vienna.
Waddington	St. Lawrence.	W. M. M. Ogden	S. Clark	W. T. Rutherford	Waddington.
Westmoreland	Oneida	D. W. Parke	V. C. Smith	L. H. Shattuck	Westmoreland.
Winfield	Herkimer	W. D. Gorsline	Z. A. Downing	M. A. McKee	West Winfield.
Yorktown	Westchester	J. B. Tompkins	Constant White	David F. Lee	Yorktown.
INDIAN SOCIETIES.					
Cattaraugus Reservation		Perry John	Jaris Pierce	W. Nephew	Versailles.
Onondaga Reservation		B. Tallchief	D. La Fort	T. Webster	Onondaga Castle.
Tonawanda Reservation		Jacob Doctor	C. W. Doctor	Isaac Shanks	Akron.

* Officers of 1871.

Nov. 14

THE JOURNAL

OF

The New-York State Agricultural Society.

VOL. XXII.] ALBANY, SEPT. AND OCT., 1872. [NOS. 9 & 10.

State Agricultural Rooms.

The Office of the Society is in the New Agricultural Hall corner of State and Lodge streets, Albany.

ANNUAL MEETING.

Pursuant to amendment of the constitution adopted at the Annual Meeting of 1872, the Annual Meeting will hereafter be held on the Wednesday succeeding the Third Tuesday of January in each year, at the City of Albany.

Annual Meeting of 1873, January 22d.

VOLUMES OF TRANSACTIONS WANTED.

The Transactions of the Society for the years 1841, 1842, 1846, 1847, 1848, 1852, 1857, 1858, 1859, 1860, 1861, are wanted, to complete sets, and members are requested to assist in obtaining them. Other volumes will be given in exchange, or payment made in money, if preferred.

AWARDS

AT THE

THIRTY-SECOND ANNUAL EXHIBITION

OF THE

NEW YORK STATE AGRICULTURAL SOCIETY,

Held at Elmira, Sept. 30 and Oct. 1, 2, 3, 4, 1872.

CLASS I.—CATTLE.

No. 1. SHORT HORNS.

SHORT HORN HERD PRIZE.

Charles F. Wadsworth, Geneseo, N. Y., Large Gold Medal.

Bull, Baron Bates 3d;

Roan, calved February 27, 1871, bred by Walcott & Campbell, New York Mills, N. Y.; sire 4th Duke of Geneva 7931, dam Lady Bates by Duke of Airdrie (12370), gr. d. Lady Bell 3d by El Hakim 2814.

Cow, Agnes;

Roan, calved April 3, 1862, bred by James S. Wadsworth, Geneseo, N. Y.; sire Macaroni 5919, dam Alice by Howard 2983, gr. d. Australia by Lord Foppington (10437).

Cow, Amena;

Red, calved January 22, 1868, bred by Craig W. Wadsworth, Geneseo, N. Y.; sire Reynolds 6115, dam Agnes by Macaroni 5919, gr. d. Alice by Howard 2983.

Cow, America;

Roan, calved February 18, 1868, bred by Craig W. Wadsworth, Geneseo, N. Y.; sire Reynolds 6115, dam Amazon by Major 5922, gr. d. Agnes by Macaroni 5919.

Cow, Oxford Rose;

Roan, calved June 29, 1863, bred by Milnor Case, Avon, Conn; sire Prince of Oxford 3308, dam Rosalie by Red Rover 2109, gr. d. Tuberose 5th by Tornado 1040.

Heifer, Rose of the Valley;

Roan, calved January 11, 1872, bred by exhibitor; sire Prince of Oxford 4th 10684, dam Oxford Rose by Prince of Oxford 3308, gr. d. Rosalie by Red Rover 2109.

BULLS OVER THREE YEARS OLD.

First prize, Lewis M. Smith, Elmira, N. Y.; Blenheim Star, red roan, calved March 23, 1866, bred by Thomas Moffat, North Dumfries, Canada; sire Nichol [494], dam Lady Anne 2d by Adam [2], gr. d. Lady Anne by East Windsor 56 .... $50

Second, Benjamin Fellows, Clifton, N. Y.; Major, red with little white, calved May 10, 1869, bred by M. H. Cochrane, Compton, Canada; sire Eleventh Duke of Thorndale 5611, dam Louan 44th by Duke of Airdrie 2743, gr. d. Louan 24th by Duke of Airdrie 2743 30

Third, William Blanshard, Penn Yan, N. Y.; Red Jacket, red, calved April 20, 1868, bred by exhibitor; sire Clifton 5450, dam Lily 3d by Altorf 2494, gr. d. Lily 2d by Challenger 324 (imp.) 10

BULLS TWO YEARS OLD.

First prize, Ira Young, Jamestown, N. Y.; Duke of Poland, red, calved March 1, 1870, bred by E. Gifford, Poland, N. Y.; sire Favorite 3d 10047, dam Jessie by Alfred 4546, gr. d. (imp.) Polyanthus by Brewster (7847) 40

Second, T. L. Harison, Morley, N. Y.; Second Baron Morley, red and white, calved September 18, 1870, bred by exhibitor; sire Rosy Duke 6142, dam Tuberose 40th by Zanoni 4534, gr. d. Tuberose 4th by Wolviston 1109 25

Third, J. W. Wadsworth, Geneseo, N. Y.; Credit, roan, calved May 6, 1870, bred by exhibitor; sire 4th Grand Duke of Oxford 5734, dam Constance by Mosstrooper 5025, gr. d. Duchess of Clarence by Duke of Portland 1482 10

YEARLING BULLS.

First prize, Charles F. Wadsworth, Geneseo, N. Y.; Baron Bates 3d, roan, calved February 27, 1871, bred by Walcott & Campbell, New York Mills, N. Y.; sire 4th Duke of Geneva 7931, dam Lady Bates by Duke of Airdrie (12370), gr. d. Lady Bell 3d by El Hakim 2814 30

Second, E. Townsend, Pavilion Centre, N. Y.; Duke of Genesee, red and white, calved July 29, 1871, bred by C. W. Wadsworth, Geneseo, N. Y.; sire Millbrook 8629, dam Alice by Howard 2983, gr. d. Australia by Lord Foppington (10437) 20

Third, Robert Bell, West Brighton, N. Y.; Saturn, red, calved May 17, 1871, bred by George Butts, Manlius, N. Y.; sire Treble Gloster 7331, dam Sprightly by Oscar 6016, gr. d. Seraph by Duke of Manlius 2773... 10

BULL CALVES.

First prize, Charles F. Wadsworth, Geneseo, N. Y.; Albert, roan, calved February 10, 1872, bred by exhibitor; sire Duke of Houston 9870, dam Agnes by Macaroni 5919, gr. d. Alice by Howard 2983....... $20

Second, C. K. Ward, Le Roy, N. Y.; Holiday, red roan, calved March 20, 1872; sire Marquis of Geneva 10451, dam Hope 3d by Perfection 2019, gr. d. Hope by Usurper (13928) 10

Commended, Benjamin Fellows, Clifton, N. Y.; Imperial Gloster, red with little white, calved February 5, 1872, bred by exhibitor; sire Treble Gloster 7331, dam Strawberry by Oscar 6016, gr. d. Spring Beauty by Apricot's Gloster 2500.

COWS OVER THREE YEARS OLD.

First prize, Charles F. Wadsworth, Geneseo, N. Y.; Amena, red, calved January 22, 1868, bred by Craig W. Wadsworth, Geneseo, N. Y.; sire Reynolds 6115, dam Agnes by Macaroni 5919, gr. d. Alice by Howard 2983 50

Second, Benjamin Fellows, Clifton, N.Y.; Strawberry, red, calved March 4, 1868, bred by George Butts, Manlius, N. Y.; sire Oscar 6016, dam Spring Beauty by Apricot's Gloster 2500, gr. d. Silkie by Apricot's Gloster 2500 30

Third, C. K. Ward, Le Roy, N. Y.; Lucy Ann 12th, red and white, calved December 26th, 1867, bred by Ezra Cornell, Ithaca, N. Y.; sire St. Valentine 4348½, dam Lucy Ann by Cunningham (12671), gr. d. Leopardess by Prince Albert 850 10

HEIFERS TWO YEARS OLD.

First prize, J. W. Wadsworth, Geneseo, N. Y.; Damask 2d, roan, calved March 16, 1870, bred by exhibitor; sire Millbrook 8629, dam Damask by Mosstrooper 5025, gr. d. Double Rose by Double Duke 1451½ 40

Second, J. W. Wadsworth, Geneseo, N. Y.; Roxana, red and white, calved March 22, 1870, bred by exhibitor; sire Duke of Houston 9870, dam Rebecca by Reynolds 6115, gr. d. Rowena by Excelsior 2830.... 25

Third, C. K. Ward, Le Roy, N. Y.; Medora 14th, red roan, calved January 31, 1870, bred by Frank D. Ward, Le Roy, N. Y.; sire Baron of Geneva 7538, dam Medora 8th by Rob Roy 4319, gr. d. Medora 4th by Usurper (13928) 10

YEARLING HEIFERS.

First prize, C. K. Ward, Le Roy, N. Y.; Hope 22d, red, calved January 3, 1871; sire Baron of Geneva 7538, dam Hope 3d by Perfection 2019, gr.d. Hope by Usurper (13928), 30

Second, W. Simpson, Jr., New Hudson, N. Y.; Venus, red and white, calved December 14, 1870, bred by exhibitor; sire Minstrel 7038, dam Tedd by Orion 784, gr. d. Elizabeth by Astoria 221 20

Heifer Calves.

First prize, Charles F. Wadsworth, Geneseo, N. Y.; Rose of the Valley, roan, calved January 11, 1872, bred by exhibitor; sire Prince of Oxford 4th 10684, dam Oxford Rose by Prince of Oxford 3308, gr. d. Rosalie by Red Rover 2109................ $20

Second, C. K. Ward, Le Roy, N. Y.; Rosebud, red roan, calved June 22, 1872; sire Marquis of Geneva 10451, dam Lucy Ann 12th by St. Valentine 4348½, gr. d. Lucy Ann by Cunningham (12671).................. 10

Lewis G. Morris, *Fordham, N. Y.*
Thomas Bell, *Eatontown, N. J.*

No. 2.—Devons.

DEVON HERD PRIZE.

Joseph Hilton, New Scotland, N. Y., Large Gold Medal.

Bull, Prince of Wales;

Calved August 31, 1864, bred by H. M. the Queen of England; sire Prince Alfred (709), dam Peony by Saracen (520a), gr. d. Crocus by Baronet (6).

Cow, Edith 2d;

Calved October 26, 1866, bred by exhibitor; sire Sachem (554), dam Edith, imported by Mr. L. G. Morris, Fordham, N. Y.

Cow, Edith 3d;

Calved November 2, 1867, bred by exhibitor; sire Sachem (554), dam Edith, imported by Mr. L. G. Morris, Fordham, N. Y.

Heifer, Belle 4th;

Calved April 10, 1869, bred by exhibitor; sire Prince of Wales 652, dam Belle 2d by Sachem (554), gr. d. Belle by Albert (2).

Heifer, Edith 4th;

Calved February 3, 1870, bred by exhibitor; sire Prince of Wales 652, dam Edith 2d by Sachem (554), gr. d. Edith, imported by Mr. L. G. Morris, Fordham, N. Y.

Heifer, Kitty;

Calved March 20, 1871, bred by exhibitor; sire Prince of Wales 652, dam Ida by Empire (424), gr. d. Edith, imported by Mr. L. G. Morris, Fordham, N. Y.

Bulls over Three Years Old.

First prize, Joseph Hilton, New Scotland, N. Y.; Prince of Wales, calved August 31, 1864, bred by H. M. the Queen of England; sire Prince Alfred (709), dam Peony by Saracen (520a), gr. d. Crocus by Baronet (6)..... $30

Second, Walter Cole, Batavia, N. Y.; Lovely's Huron 3d, calved February, 1869, bred by exhibitor; sire Queen Anne's Huron 320, dam Lovely 18th by Young Exeter (765), gr. d. Lovely 3d by Washington (130).... 20

Bulls Two Years Old.

First prize, Walter Cole, Batavia, N. Y.; Helena's Huron 9th, calved October, 1869, bred by exhibitor; sire Queen Anne's Huron 320, dam Helena 16th by Omer Pasha (473), gr. d. Helena 3d by May Boy (71). $30

Yearling Bulls.

First prize, Quidnesset Farm, East Greenwich, R. I.; Duke of Flitton 9th, calved July 5, 1871, bred by James Davy, Flitton-Barton, North Molton, Devon, England; sire Duke of Flitton 4th (827), dam Cherry 3d by Duke of Flitton 2d (825), gr. d. Cherry by Napoleon 3d (464)..................... 25

Second, Joseph Hilton, New Scotland, N. Y.; Prince of Wales 10th, calved March 20, 1871, bred by exhibitor; sire Prince of Wales 652, dam Belle 2d by Sachem (554), gr. d. Belle by Albert (2)............... 15

Third, W. E. Arnold, Otego, N. Y.; Prince Albert, calved May 1, 1871, bred by exhibitor; sire Young Washington 387, dam Princess Beatrice by Crown Prince (604), gr. d. Victoria......................... 10

Bull Calves.

First prize, Walter Cole, Batavia, N. Y.; Lovely's Huron 4th, calved June 8, 1872, bred by exhibitor; sire Lovely's Huron 3d 519, dam Lovely 18th by Young Exeter (765), gr. d. Lovely 3d by Washington (130)................................ 20

Cows over Three Years Old.

First prize, Joseph Hilton, New Scotland, N. Y.; Belle 4th, calved April 10, 1869, bred by exhibitor; sire Prince of Wales, dam Belle 2d by Sachem (554), gr. d. Belle by Albert (2)................................... 30

Second, Walter Cole, Batavia, N. Y.; Lovely 18th, calved 1862, bred by Ambrose Stevens, Batavia, N. Y.; sire Young Exeter (765), dam Lovely 3d by Washington (130), gr. d. Lovely by Meguntiook (251).......... 20

Third, Walter Cole, Batavia, N. Y.; Helena 32d, calved March 31, 1864, bred by C. S. Wainwright, Rhinebeck, N. Y.; sire Comet (162), dam Helena 7th by May Boy (71), gr. d. Helena 2d by Meguntiook (251)... 10

Heifers Two Years Old.

First prize, Joseph Hilton, New Scotland, N. Y.; Edith 4th, calved February, 1870, bred by exhibitor; sire Prince of Wales 652, dam Edith 2d by Sachem (554), gr. d. Edith, imported by L. G. Morris, Fordham, N. Y................................ 30

Second, Quidnesset Farm, East Greenwich, R. I.; The Queen, calved August 21, 1870, bred by H. M. the Queen of England, at the Norfolk farm, Windsor; sire Napier (888), dam Rosa by Prince Alfred (709), gr. d. Daphne by Earl of Exeter (38)..... 20

Third, Quidnesset Farm, East Greenwich, R. I.; Picture, calved November, 1869, bred by James Davy, Flitton-Barton, North Molton, Devon, England; sire Duke of Edinburgh (823), dam Picture 6th by Prince Alfred (491), gr. d. Picture by a bull of Mr. Davy's $10

YEARLING HEIFERS.

First prize, Walter Cole, Batavia, N. Y.; Helena 44th, calved February 23, 1871, bred by exhibitor; sire Queen Anne's Huron 320; dam Helena 34th by Iroquois 564, gr. d. Helena 33d by Comet (162)............. 25

Second, Joseph Hilton, New Scotland, N. Y.; Kitty, calved March 20, 1871, bred by exhibitor; sire Prince of Wales 652, dam Ida by Empire (424), gr. d. Edith imported by Mr. L. G. Morris, Fordham, N. Y....... 15

Third, Joseph Hilton, New Scotland, N. Y.; Jenny, calved April 30, 1871, bred by exhibitor; sire Prince of Wales 652, dam Edith 3d by Sachem (554), gr. d. Edith, imported by Mr. L. G. Morris, Fordham, N. Y.................................. 10

HEIFER CALVES.

First prize, Joseph Hilton, New Scotland, N. Y.; Edith 5th, calved December 30, 1871, bred by exhibitor; sire Prince of Wales 652, dam Edith 2d by Sachem (554), gr. d. Edith, imported by Mr. L. G. Morris, Fordham, N. Y........................ 20

Second, Walter Cole, Batavia, N. Y.; Candy Girl 2d, calved April 13, 1872, bred by exhibitor; sire Lovely's Huron 3d 591, dam Candy Girl by Empire 5th 213, gr. d. Lovely 8th by Candy (153)............. 10

TOBIAS BOUCK, *Schoharie, N. Y.*
D. B. HAIGHT, *Dover Plains, N. Y.*

NO. 4. AYRSHIRES.

AYRSHIRE HERD PRIZE.

Brodie, Son & Converse, Rural Hill and Woodville, N. Y., Large Gold Medal.

Bull, Duke of Hamilton;

Red and white, calved July, 1870, bred by Mr. Kirkwood, Scotland; sire Gilpin, dam Mary.

Cow, Killarnie Maid;

Red and white, calved May, 1867, bred by Robert Kerr, Scotland; sire Trump, dam Lady Gray by Clarence.

Cow, Lady Ayr;

Red and white, calved April, 1869, bred by R. Caldwell, Scotland; sire Geordie, dam White Face by Jock.

Cow, Ayrshire Lass;

Red and white, calved April, 1869, bred by Hugh Roger, Scotland; sire Colly Hill, dam Rosebud.

Cow, Beulah;

Red with little white, calved June, 1869, bred by R. Caldwell, Scotland; sire Geordie, dam Queen by Jock.

Heifer, Lady Mary;

Red and white, calved May, 1870, bred by R. Caldwell, Scotland; sire Geordie, dam May Flower 3d by Jock.

There were but three competitors in this class, and two of the herds were of nearly equal quality. The committee would honourably mention the herd of Mr. Frank D. Curtis, of Charlton, N. Y.

AYRSHIRE BULLS OVER THREE YEARS OLD.

First prize, Thomas Paterson, Gouverneur, N. Y.; Lord Raglan, brown and white, calved 1869, bred by James Graham, Stirlingshire, Scotland; sire Baldie (imp.), dam Snow Flake (imp.) $30

Second, John Stryker, Rome, N. Y.; Treasurer, red and white, calved September 23, 1869, bred by Walcott & Campbell, New York Mills, N. Y.; sire Tarbolton 372, dam Treasure by Baldy 90, gr. d. Highland Mary by Kilburn 229 20

Third, James Miller, Penn Yan, N. Y.; Sir Colin, white and red, calved May 28, 1869, bred by Thomas Thompson, Dunbar, Ont.; sire Marquis 709, dam Lily by Garabaldi, gr. d. Mary by Sir Colin 67....... 10

There were but three shown. Lord Raglan, the first prize, was a bull with excellent hips; loins and quarters unusually deep; fine forward. His tail was badly set on, however, and deeply notched at junction with body.

Treasurer was a showy bull, low on his legs and a good handler. His head was disproportionately large, and his body rather heavy forward.

Sir Colin had a good head and handled well, but his back was somewhat uneven and his loins rather sloping.

AYRSHIRE BULLS TWO YEARS OLD.

First prize, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Woodville Chief, red and white, calved May, 1870, bred by M. Robertson, Scotland; sire General Lee, dam Beauty 2d by Kilburn.............. $30

Second, Frank D. Curtis, Charlton, N. Y.; Heber Kimball, red, white flecks, calved September 11, 1870, bred by Charles S. Lester, Saratoga Springs, N. Y.; sire Walton 393, dam Marion by Tam 72, gr. d. Nannie by Norribo 50.............................. 20

Third, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Duke of Hamilton, red and white, calved July, 1870, bred by Mr. Kirkwood, Scotland; sire Gilpin, dam Mary 10

Five showed in this class, which is rather superior to the preceding Woodville Chief is a very stylish bull, flat-boned and low on legs, with good escutcheon, straight back and good hips and quarters.

Heber Kimball has a broad back, with good quarters. His hips a little sloping. His horns slightly coarse. Stands low forward, and is rather a good bull.

Duke of Hamilton is somewhat undersized, with good loins and deep quarters; a little high on legs, and a poor expression to face; a good bull, however.

AYRSHIRE BULLS ONE YEAR OLD.

First prize, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Jefferson Lad, red and white, calved April 15, 1871, bred by J. F. Converse, Woodville, N. Y.; sire Shoo Fly 856, dam Rosa 3d by John Gilpin 222, gr. d. Rosa $25

Second, L. D. Stowell, Black Creek, N. Y.; Sandy, red and white, calved March 25, 1871, bred by William Birnie, Springfield, Mass.; sire Rob Roy 823, dam Katy-did by Honest John 199, gr. d. Kitty 6th by Blossom 10 15

Third, E. C. Holden, McGrawville, N. Y.; Prince of Jessie, red, brown and white, calved April 10, 1871, bred by exhibitor; sire Governor 8th, dam Jessie by Zero (imported by William E. Lockwood, of Penn.), gr. d. Katie (imported by Mr. Lockwood), 10

Five shown in this class. Jefferson Lad is an excellent handler, with good head and hips; straight back, fine bone and stands medium, neither low nor high. His escutcheon is small, and his neck a little heavy.

Sandy is a bull with very waxy and handsome horn; shoulders bad at the crops; escutcheon of good size; a good handler.

Prince of Jessie is rather high on his legs; his tail is set on rather far back. He handles well and has a good escutcheon.

AYRSHIRE BULL CALVES.

First prize, John Stryker, Rome, N. Y.; Stanwix, red and white, calved April 10, 1872, bred by exhibitor; sire Treasurer, dam Lady Peters by Kyle 234, gr. d. Phœmie by Buccleugh 107 .... $20

Second, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Fearnot, red and white, calved March 30, 1872, bred by J. F. Converse, Woodville, N. Y.; sire Woodville Chief (imp.), dam Ayrshire Queen by General Grant 176, gr. d. Flora Temple 3d by John Gilpin 222 10

Six shown. Stanwix is a handsome, showy animal, with broad head and fine muzzle; back straight, low on his legs and bone fine. His throat is somewhat heavy and his body a little flat. An animal of good promise.

Fearnot handles well, has a good escutcheon, thin thigh and fine bone. His hips are a little narrow, and his shoulders scarcely perfect.

AYRSHIRE COWS OVER THREE YEARS OLD.

First prize, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Killurnie Maid, red and white, calved May, 1867, bred by Robert Kerr, Scotland; sire Trump, dam Lady Gray by Clarence $30

Second, Frank D. Curtis, Charlton, N. Y.; Diana 2d, white and red, calved March 20, 1867, bred by C. I. Hayes, Unadilla, N. Y.; sire Doon 151, dam Diana bred by William Watson, West Farms, N. Y 20

Third, Thomas Paterson, Gouverneur, N. Y.; Victoria, brown and white, calved April, 1869, bred by James Graham, Sterlingshire, Scotland; sire Robert, dam Kilbrownie by Hopeful 10

Eleven shown. Killurnie Maid is a large, stylish cow, with deep flanks and quarters, and broad hips. The udder large, scarcely well formed, and slightly drooping; the escutcheon good, and twist fine. A fine, vigorous animal.

Diana 2d is an excellent cow, with well formed udder and teats well placed. The body good, the hips broad, and the quarters, flanks and loins deep; escutcheon grand. A superior cow.

Victoria is a neat, stylish cow, with beautiful neck, head and horns; fore quarters excellent; back straight, hips reasonably broad and quarters deep; udder not flat soled; escutcheon good.

These cows were very nearly equal in their way, and while one excelled in style and substance, another excelled in symmetry, and a third in that quality which we should define as evidence of high breeding.

AYRSHIRE HEIFERS TWO YEARS OLD.

First prize, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Lady Houston, red and white, calved May, 1870; bred by R. Wilson, Scotland; sire Jock, dam Mary Gray $30

Second, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Lady Mary, calved May, 1870; bred by R. Caldwell, Scotland; sire Geordie, dam May Flower 3d by Jock.... 20

Third, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Lady Pender, red, calved June, 1870, bred by A Pender, Scotland; sire Robin Hood, dam Rosa.... 10

Five shown in this class, and not superior as a class. Lady Houston and Lady Mary were very evenly matched. While Lady Mary was the somewhat prettier animal of the two, Lady Houston gave

indications of greater usefulness. Lady Pender had a well formed udder, a good escutcheon, and was a good handler.

Ayrshire Heifers, One Year Old.

First prize, Frank D. Curtis, Charlton, N. Y.; Pet, white and red, calved June 1, 1871, bred by exhibitor; sire Doon 2d 152, dam Matchless 4th by Doon 151, gr. d. Matchless by Dandy 7th...................... $20

Second, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Dolly Varden, red and white, calved May, 1871, bred by J. F. Converse, Woodville, N. Y.; sire Shoo Fly 856, dam Velvet by General Grant 176, gr. d. Rosa 3d by John Gilpin 222 15

Third, L. D. Stowell, Black Creek, N. Y.; Florence, red and white, calved January 25, 1871, bred by S. D. Hungerford, Adams, N. Y.; sire Abraham Lincoln 404, dam Challenge 7th by Ayrshire Chief 88, gr. d. Challenge (imp.) 10

Seven shown. Pet is a neat animal, with waxy horns. She stands low forward, has a fine body and promising udder, with a good escutcheon; crops rather broad.

Dolly Varden is a broad-hipped, flat-boned heifer, with a good body; a little heavy forward, and neck a little thick. The shoulders well filled, and udder promising.

Florence is a beast with elegant, waxy horns; of good handling, and fine shoulders. Hips rather sloping, and notch at joining on of tail; udder promising.

Ayrshire Heifer Calves.

First prize, Brodie, Son & Converse. Rural Hill and Woodville, N. Y.; Ocean Belle 2d, red and white, calved April, 1872, bred by J. F. Converse, Woodville, N. Y.; sire Woodville Chief, dam Ocean Belle (imp.).. $20

Second, Frank D. Curtis, Charlton, N. Y.; Bonnie Lassie 4th, red and white, calved February 20, 1872, bred by exhibitor; sire Doon 2d 152, dam Bonnie Lassie by Hartford, gr. d. Daisy 1st by Sir Walter, bred by Hungerford & Brodie, Adams, N. Y............. 10

But three shown. The two premium animals were so evenly matched, that your judges differed and had to call for assistance. While both were good animals, they differed much in size and style. Ocean Belle 2d showed great style, while Bonnie Lassie 4th had a pleasant head, and back finely wedge-shaped, looking from above.

Your judges desire to express their gratification at the promptness and quietness attending the showing of the animals in the rings, and the courteous bearing of the officers of the Society, exhibitors and spectators.

E. Lewis Sturtevant,
South Framingham, Mass.
Richard Gibson, *London, Canada.*

No. 5.—Jerseys.

JERSEY HERD PRIZE.

William Crozier, Northport, N. Y., Large Gold Medal.

Bull, Beacon Comet 8th;

Solid fawn, calved February 10, 1870, bred by exhibitor; sire Beacon Comet, dam Josephine (imp).

Cow, Caroline;

Fawn and white, calved 1865, bred by Capt. Amy, Grouville, Jersey.

Cow, Josephine;

Mulberry fawn and white, calved 1864, bred by Eli Hubert, St. Owens, Jersey.

Cow, Jersey Belle 4th;

Fawn, calved March 21, 1869, bred by exhibitor; sire Don Pedro 127, dam Belle of Jersey by Comet 130, gr. d. Jersey Belle 2d.

Heifer, Caroline 4th.

Dark fawn, calved March, 1871, bred by exhibitor; sire Beacon Comet, dam Caroline (imp.).

Heifer, Josephine 2d.

Fawn, calved April 20, 1871, bred by exhibitor; sire Comet, dam Josephine (imp.).

Bulls over Three Years Old.

First prize, Quidnesset Farm, East Greenwich, R. I.; Mogul, brown, calved September 5, 1869, bred by Mr. Le Gallais, in Jersey... $30

Second, George I. Pumpelly, Owego, N. Y.; Atlantic, squirrel gray, calved 1869, imported by Davis Collamore, Orange, N. J.. 20

Third, W. B. Dinsmore, Staatsburgh, N. Y.; Hector, brown, calved July, 1868, imported by exhibitor, August 1870............... 10

Bulls Two Years Old.

First prize, William Crozier, Northport, N. Y.; Beacon Comet 8th, solid fawn, calved February 10, 1870, bred by exhibitor; sire Beacon Comet, dam Josephine, (imp.).... 30

Second, W. B. Dinsmore, Staatsburgh, N. Y; Yankee, light fawn, calved 1870, imported by exhibitor, August, 1872.............. 20

Third, Joseph Juliand, Bainbridge. N. Y.; Rubric, dark fawn, brown and gray, calved February 19, 1870, bred by Thomas J. Hand, Sing Sing, N. Y.; sire Lawrence 61, dam Motto by Prince 55, gr. d. Ophir by Prince 55.............................. 10

YEARLING BULLS.

First prize, W. B. Dinsmore, Staatsburgh, N. Y.; Quaker, gray, brown, calved November 8th, 1870, bred by exhibitor, imported in dam Queen $30

BULL CALVES.

First prize, W. B. Dinsmore, Staatsburgh, N. Y.; Vermont, gray and brown, calved March 21, 1872, bred by exhibitor; sire Governor, dam Victoria (imp. 1870) 20

Second, W. B. Dinsmore, Staatsburgh, N. Y.; Essex, gray, calved October 17, 1871, bred by exhibitor; sire Governor, dam Eve 5th by Jerry (15), gr. d. Eve (imp.) 10

Commended, Frank D. Curtis, Charlton, N. Y.; William, brown, calved Februray 1, 1872, bred by William Crozier, Northport, N. Y.; sire Beacon Comet, dam Pansy 2d imported in her dam Pansy, by Carlos Pierce, Stanstead, Canada.

COWS OVER THREE YEARS OLD.

First prize, William Crozier, Northport, N. Y.; Jersey Belle 4th, fawn, calved March 21, 1869, bred by exhibitor; sire Don Pedro 127, dam Belle of Jersey by Comet 130, gr. d. Jersey Belle 2d 30

Second, Frank D. Curtis, Charlton, N. Y.; Caroline 2d, light fawn, calved April 19, 1869; sire a bull of Eli Hubert's in Jersey, dam Caroline, imported by M. H. Cochrane, Compton, Canada 20

Third, William Crozier, Northport, N. Y.; Josephine, mulberry fawn and white, calved 1864, bred by Eli Hubert, St. Owens, Jersey 10

HEIFERS TWO YEARS OLD.

First prize, W. B. Dinsmore, Staatsburgh, N. Y.; Blue Bell, light brown, calved June 2, 1870, imported by exhibitor August, 1872 30

Second, Edwin Shaw, Hamden, N. Y.; Petty Pet, black and white, calved April 27, 1870, bred by exhibitor; sire Morino, dam Sal (imp) 20

Third, W. B. Dinsmore, Staatsburgh, N. Y.; Gipsy 5th, dark gray, calved April 1, 1870, bred by exhibitor; sire Napoleon 291, dam Gipsy, imported by exhibitor 10

YEARLING HEIFERS.

First prize, William Crozier, Northport, N. Y.; Caroline 4th, dark fawn, calved March, 1871, bred by exhibitor; sire Beacon Comet, dam Caroline (imp.) 25

Second, W. B. Dinsmore, Staatsburgh, N. Y.; Granny, light fawn, calved, April 3, 1871, bred by exhibitor; sire Napoleon 291, dam Gipsy 2d, imported September 10, 1865, by exhibitor 15

Third, Quidnesset Farm, East Greenwich, R. I.; Camilla 4th, squirrel fawn and black, calved August 22, 1871, bred by exhibitor; sire Mogul (568), dam Camilla (2020), bred by J. A. Taintor, Hartford, Conn $10

HEIFER CALVES.

First prize, W. B. Dinsmore, Staatsburgh, N. Y.; Ruby, gray, calved May 17, 1872, bred by exhibitor; sire Jenkins, dam Rachel 2d, imported by exhibitor in dam Rachel 20

Second, W. B. Dinsmore, Staatsburgh, N. Y.; Gracie 3d, light fawn, calved April 23, 1872, bred by exhibitor; sire Emperor 287, dam Gracie imported by exhibitor 10

Commended, Frank D. Curtis, Charlton, N. Y.; Jennie Douglas, fawn, gray and white, calved January 6, 1872, bred by William Crozier, Northport, N. Y.; sire Beacon Comet, dam Bessy by Abraham 228, gr. d. Nell by Don.

J. HOWARD MCHENRY, *Pikesville, Md.*
M. C. WELD, *Closter, N. J.*

NO. 6. HOLSTEINS.

BULLS OVER THREE YEARS OLD.

First prize, Thomas B. Wales, Jr., South Framingham, Mass.; Van Tromp 2d, calved February 4, 1869, bred by W. W. Chenery, Belmont, Mass.; sire Van Tromp (imp.), dam Texelaar 3d, gr. d. Texelaar (imp.) 30

YEARLING BULLS.

First prize, H. C. Hoffman, Horseheads, N. Y.; Fourth Earl of Middlesex, white and black, calved March 4, 1871, bred by Winthrop W. Chenery, Belmont, Mass.; sire Texelaar 6th, dam Zuider Zee (imp.) 20

BULL CALVES.

First prize, Thomas B. Wales, Jr., South Framingham, Mass.; Van Tromp 4th, calved May 10, 1872, bred by exhibitor; sire Van Tromp 2d, dam Maid of Opperdoes (imp.) by Van Tromp (imp.)., ... 20

COWS OVER THREE YEARS OLD.

Thomas B. Wales, Jr., South Framingham, Mass.; Maid of Opperdoes, calved April, 1859, imported 30

HEIFERS TWO YEARS OLD.

Thomas B. Wales, Jr., South Framingham, Mass.; Zuider Zee 9th, calved March 4, 1870, bred by W. W. Chenery, Belmont, Mass.; sire Van Tromp (imp.), dam Zuider Zee (imp.) 30

YEARLING HEIFERS.

Thomas B. Wales, Jr., South Framingham, Mass.; Maid of Holstein, calved March 12, 1871, bred by exhibitor; sire Opperdoes 7th, dam Maid of Opperdoes (imp.) by Van Tromp (imp.) 25

Your judges regret that there was but one entry in each division of class No. 6 Holsteins, and but two exhibitors.

E. LEWIS STURTEVANT,
South Framingham, Mass.
RICHARD GIBSON, *London, Canada.*

No. 7.—MILCH COWS AND GRADES.

MILCH COWS.

First prize, John C. Welles, Athens, Penn; Buff (Ayrshire and Jersey); date of calving May 1, 1872 .... $30

Second, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Dew Drop, red and white, calved June 1, 1860, bred by J. F. Converse, Woodville, N. Y.; sire Kilburn 229, dam Flora Temple by Kilburn 229, gr. d. Peach Blow by Kilburn 229; date of calving July 1, 1872 20

Third, William A. Ward, Elmira, N. Y.; Pet (Short Horn); red, calved April, 1864, bred by exhibitor; date of calving March 1, 1872 10

GRADE SHORT HORN COWS AND HEIFERS.

First prize, Robert Bell, West Brighton, N. Y.; Lady Darling, red and white, calved May 6, 1864, bred by Joseph Williams, West Henrietta, N. Y.; sire Short Horn, dam grade Short Horn 20

Second, Robert Bell, West Brighton, N. Y.; Gem, white, calved May 28, 1869, bred by exhibitor; sire Marmaduke (Short Horn), dam grade Short Horn 15

Third, O. Howland, Auburn, N. Y.; Hattie, red, 7 years old, bred by D. Swarthout; sire Son of Double Duke, dam unknown .. 10

GRADE DEVON COWS AND HEIFERS.

First prize, Walter Cole, Batavia, N. Y.; Eunice, calved July, 1871, bred by N. K. Cone, Batavia, N. Y.; sire Devon, dam three-quarter Devon 20

Second, Walter Cole, Batavia, N. Y.; Alice, calved in the fall of 1867, bred by William Francis, Batavia, N. Y.; sire Queen Anne's Huron 320 15

Third, O. Howland, Auburn, N. Y.; Molly, dark red, 7 years old, bred by A. Hultz; sire thoroughbred Devon, dam half Devon .. 10

GRADE AYRSHIRE COWS AND HEIFERS.

First prize, E. B. Hawks, Wells Bridge, N. Y.; Minny 2d, red and white, calved April 10, 1871, bred by exhibitor; sire Lord Cuthbert (Ayrshire), dam Minny 1st (grade Ayrshire) 20

Second, E. B. Hawks, Wells Bridge, N. Y.; Minny, red and white, calved April 5, 1864, bred by exhibitor; sire Dandy (Ayrshire), dam Ayrshire and Devon 15

Third, E. C. Holden, McGrawville, N. Y.; Buttercup, yellow, brown and white, calved March 29, 1867, bred by exhibitor; sire Governor 6th, dam native (calved April 20), $10

GRADE JERSEY COWS AND HEIFERS.

First prize, Joseph Juliand, Bainbridge, N. Y.; white with fawn spots, 1 year, bred by exhibitor; sire three-quarters Jersey, dam pure Jersey 20

Second, J. S. Holbert, Chemung, N. Y.; Nancy, fawn, calved March 16, 1871, bred by exhibitor; sire Jersey, dam grade 15

Third, J. S. Holbert, Chemung, N. Y.; Rose, Jr., fawn, calved March 29, 1871, bred by exhibitor 10

COMMENDED.

H. C. Hoffman, Horseheads, N. Y.; grade Holsteins.

No. 8.—OXEN, STEERS AND FAT CATTLE.

WORKING OXEN OVER FIVE YEARS OLD.

First prize, Joseph Hilton, New Scotland, N. Y.. 20

Second, Wellington Woodward, Jamestown, N. Y 15

Third, Charles H. Roy, Wells, Penn 10

WORKING OXEN FOUR YEARS OLD.

Second prize, A. L. Thomas, Cuba, N. Y 15

FAT OXEN OVER FOUR YEARS OLD.

First prize, J. W. Wadsworth, Geneseo, N. Y.. 20

Second, James McCann, Elmira, N. Y 15

FAT HEIFERS THREE YEARS OLD.

First prize, C. C. B. Walker, Corning, N. Y.. 20

JOSEPH E. ELY, *Binghamton, N. Y.*
WILLIAM E. ARNOLD, *Otego, N. Y.*

CLASS II.—HORSES.

No. 9.—BREEDING AND GROWING STOCK.

SPECIAL PREMIUM OFFERED BY A MEMBER OF THE SOCIETY FOR THE BEST STALLION FOR GENERAL PURPOSES, OVER SIX YEARS OLD AND NOT LESS THAN 15 HANDS 3 INCHES HIGH, THAT HAS BEEN KEPT FOR MARES THE PAST SEASON, AND HAS SERVED NOT FEWER THAN FIFTEEN. OPEN TO ALL STALLIONS IN THE UNITED STATES AND CANADA.

Guy Miller, Chester, N. Y.; Iron Duke, brown, 15.3½, 12 years; by Rysdyk's Hambletonian, dam by Miller's Sir Henry $200

STALLIONS FOR GENERAL PURPOSES, EACH TO BE ACCOMPANIED BY NOT LESS THAN FIVE OF HIS PRODUCE, ONE YEAR OLD OR OVER; THE MERITS OF BOTH SIRE AND PRODUCE TO BE CONSIDERED.

First prize, E. N. Thomas, Rose, N. Y.; Crittenden, Jr., bay, 15.3, 7 years; by John J. Crittenden, dam by Abdallah... Gold Medal.

Second, E. W. Taylor, Elmira, N. Y.; Taylor's Hambletonian La Fayette, bay, 15.2, 13 years; by Rysdyk's Hambletonian, dam by Montgomery Roebuck $30

DRAUGHT.

STALLIONS OVER FIVE YEARS OLD.

First prize, Chauncey L. Call, Watkins, N. Y.; Young Byron, 16 hands, 12 years; by Lord Byron, dam a Clydesdale mare by Rob Roy 30

Second, Sidney Daly, Castile, N. Y.; Black Jim, black, 15.3, 6 years, 1,275 pounds; French and Black Hawk stock........... 20

STALLIONS UNDER FIVE AND OVER THREE YEARS OLD.

First prize, William Meikle, Seven Mile House, Ohio; Marquis of Lorne (imp. Clydesdale), dappled gray, 16.3, 4 years, bred by Henry Shanks, Deans, Scotland; sire Surprise, dam Maggie, a prize mare at Aberdeen.... $25

Second, William C. Douglas, Newfield, N. Y.; Young Count, dark gray, 16, 4 years, bred by Robert Mutch, Pickering, Canada; by Comet, dam by Canadian Farmer........ 15

STALLIONS UNDER THREE YEARS OLD.

First prize, William Jackson, Fosterville, N. Y.; British Yoeman, bay, 2 years; by Emigrant, dam Doll by Samson 5th, gr. d. by Honest Tom (imp.)................... 20

Second, William Meikle, Seven Mile House, Ohio; Young Campsie (imp. Clydesdale), bay, 2 years, bred by Thomas Carlan, Dyke, Scotland; sire Old Campsie, dam a first prize mare at Kelso................ 10

MARES WITH FOALS AT FOOT.

First prize, William Jackson, Fosterville, N. Y.; Doll, bay, 11 years old; by Samson 5th, dam by Honest Tom (imp.), gr. d. by Louis Phillippe 4th.................... 30

Second, John B. Rockwell, Horseheads, N. Y.; black, 15.2, 7 years 20

FILLIES UNDER THREE YEARS OLD.

Second prize, John B. Rockwell, Elmira, N. Y.; black, 2 years old........................ 10

CARRIAGE AND CAVALRY.

STALLIONS OVER FIVE YEARS OLD AND NOT LESS THAN 15 HANDS 3 INCHES HIGH.

First prize, L. G. Morris, Fordham, N. Y.; Arcturus, blood bay, 16, 5 years, bred by exhibitor; by Rysdyk's Hambletonian, dam by True Messenger $30

Second, R. W. Cameron, New York; Bonnie Dundee, dark bay, 16.1½, 8 years, by Balrownie, dam Sacrifice filly by Melbourne, gr. d. Sacrifice........................ 20

STALLIONS UNDER FIVE AND OVER THREE YEARS OLD.

First prize, Reuben Rowley, Fillmore, N. Y.; Young Tom Thumb, black, 15.3, 3 years, bred by Thomas Brown, Caledonia, N. Y.; by Old Tom Thumb (imp.), dam Eclipse by Canadian Lion..................... $25

Second, E. N. Thomas, Rose, N. Y.; Chris. Bradley, bay, 3 years; by Crittenden, Jr., dam Pauline 15

STALLIONS UNDER THREE YEARS OLD.

First prize, A. F. Wilcox, Fayetteville, N. Y.; Onondaga, bay, 15.1, 2 years; by Williams' Hambletonian, dam Lady Bender by Fulmer's Dragon, gr. d. by Duroc 20

Second, J. D. Bennett, Harpersville, N. Y.; dark chestnut, 15.2, 2 years; sire unknown, dam Messenger and Morgan...... 10

MARES NOT LESS THAN 15 HANDS 3 INCHES HIGH, WITH FOALS AT FOOT.

First prize, Almon Gratsinger, Elmira, N. Y.; bay, 16, 19 years $30

Second, A. L. Thomas, Cuba, N. Y.; Jane, bay, 16.1, 8 years, bred by exhibitor; by Reindeer Messenger, dam by Sir Isaac (imp.); foal at foot by Rattler, Jr....... 20

FILLIES UNDER FIVE AND OVER THREE YEARS OLD.

First prize, Bernard McGinnis, Bentley Creek, N. Y.; bay, 15.1, 3 years.............. $25

FILLIES UNDER THREE YEARS.

First prize, E. N. Thomas Rose, N. Y.; Nellie Hill, bay, 2 years; by Crittenden, Jr., dam by Felton's (son of Hill's) Black Hawk, gr. d. by Miller's Sir Henry............. 20

Second, George Sidney, Elmira, N. Y.; bay, 13, 1 year............................ 10

ROADSTERS.

STALLIONS OVER FIVE YEARS OLD, LESS THAN 15 HANDS 3 INCHES HIGH AND NOT LESS THAN 15 HANDS.

First prize, M. E. Williams, Chatham Village, N. Y.; Berkshire Boy, bay, 15.2, 7 years; by Goodrich's Rattler, dam Lady Agnes by Rysdyk's Hambletonian.............. $30

Second, L. G. Morris, Fordham, N. Y.; Orion, gray, 15.1½, 6 years, bred by exhibitor; by Rysdyk's Hambletonian, dam May by True Messenger........................ 20

STALLIONS UNDER FIVE AND OVER THREE YEARS OLD.

First prize, Ira H. & T. Coleman, Sheldrake, N. Y.; Hambletonian, chestnut, 15.3, 4 years; by Seneca Chief, dam by old Champion.................................. $25

Second, John W. Jones, Elmira, N. Y.; Walter Jones, brown, 15.2, 4 years, bred by exhibitor; by Bay Billy, dam by Andrew Jackson.............................. 15

STALLIONS UNDER THREE YEARS OLD.

First prize, L. G. Morris, Fordham, N. Y.; Sagittarius, gray, 14.3, 1 year, bred by exhibitor; by Orion, dam Marchioness by Gray Messenger........................ $20

Second, E. R. Abbott, Goshen, N. Y.; Messenger Abdallah, mahogany bay, 2 years; by Rice Graves, dam by Old Guy Miller, gr. d. by Old Abdallah.................... 10

MARES (WITH FOALS AT FOOT) LESS THAN 15 HANDS 3 INCHES HIGH, AND NOT LESS THAN 14 HANDS 3 INCHES.

First prize, Andrew Suffern, Elmira, N. Y.; bay, 15, 12 years...................... $30

Second, Ira H. Coleman, Sheldrake, N. Y.; bay, 15.2, 10 years; by Old Champion, dam by Old General Gifford; foal at foot by Seneca Chief...................... 20

FILLIES UNDER FIVE AND OVER THREE YEARS OLD.

First prize, L. G. Morris, Fordham, N. Y.; Marietta, bay, 15.1½, 3 years, bred by exhibitor; by Rysdyk's Hambletonian, dam by True Messenger..................... $25

Second, John Young, Syracuse, N. Y.; Rose, chestnut, 3 years; sire Lysander, dam by Oakley's Black Hawk, gr. d. by (imp.) Sir Tatten Sykes 15

FILLIES UNDER THREE YEARS OLD.

First prize, L. G. Morris, Fordham, N. Y.; Julia, gray, 15.1½, 2 years, bred by exhibitor; by The Marshal, dam by Rysdyk's Hambletonian 20

Second, E. N. Thomas, Rose, N. Y.; White Stockings, bay, 2 years; by Crittenden, Jr., dam Lucy by Long Island........... 10

In returning the list prepared for us, the judges also return thanks to the officers who have so promptly and efficiently assisted in performing the duties assigned them.

The ordinary difficulties and pleasures have kept company, that is, the exhibitors have had the hardships, and the animals have jumped, played and kicked to gratify those who enjoyed looking on. We have arrived at our conclusions by the *appearance* of the horses at this time, and claim no power to know their merits from any other tests. Hoping our opinions may encourage all and discourage none, we respectfully submit our report.

CHARLES D. MILLER, *Geneva, N. Y.*
RICHARD CHURCH, *Belvidere, N. Y.*

No. 10.—WORK HORSES.

FARM OR TEAM HORSES WEIGHING UNDER 2,500 POUNDS AND OVER 2,000 POUNDS THE PAIR.

First prize, James F. Copley, Elmira, N. Y.; black mares, 15.3, 7 and 8 years......... $30

CARRIAGE HORSES OVER 16 HANDS AND WEIGHING NOT LESS THAN 2,400 POUNDS.

First prize, Henry Vosburgh, Port Byron, N. Y.; bays, 16, 6 and 7 years.......... $30

Second, George Decker, Wellsburgh, N. Y.; dark bays, stallion and gelding, 16.1, 5 years old. 15

CARRIAGE HORSES 15 HANDS 3 INCHES HIGH AND NOT OVER 16 HANDS 1 INCH.

First prize, Henry Karigar, Castile, N. Y.; blacks, 16, 5 years..................... $30

Second, R. M. Remington, Auburn, N. Y.; browns, 16, 4 and 5 years............... 15

CARRIAGE HORSES LESS THAN 15 HANDS 3 INCHES HIGH AND NOT LESS THAN 15 HANDS.

First prize, E. C. Burtis, Auburn, N. Y.; chestnut mares............................ $30

Second, V. C. Utter, Perry, N. Y.; chestnut geldings, 15, 7 years..................... 15

CART HORSES WEIGHING OVER 1,200 POUNDS.

Second, A. D. Griswold, Southport, N. Y.; bay gelding, 15.3, 18 years.................. 10

SINGLE HARNESS HORSES 15 HANDS 3 INCHES HIGH OR OVER.

First prize, L. G. Morris, Fordham, N. Y.; Juno, gray, 16.1½, 6 years, bred by exhibitor; by Rysdyk's Hambletonian, dam by True Messenger $20

Second, Frederick W. Dounce, Elmira, N. Y.; bay, 16, 7 years 10

SINGLE HARNESS HORSES 15 HANDS HIGH AND LESS THAN 15 HANDS 3 INCHES.

First prize, J. C. Simons, Elmira, N. Y.; bay, 4 years................................ $20

Second, E. N. Thomas, Rose, N. Y.; Chad, bay gelding, 15.2½, 3 years, by Crittenden, Jr., dam Lucy by Long Island........... 10

SADDLE HORSES 15 HANDS 2 INCHES HIGH OR OVER.

First prize, J. Edgar Payne, Franklin, N. Y.; Don Quixote, bay, black and white stallion, 15.2, 7 years; by Spotted Chief, dam Mambrino Messenger stock.............. $20

PONIES LESS THAN 14 HANDS HIGH.

First prize, Joseph Juliand, Bainbridge, N. Y.; Beauty, bay mare, 13.2, 6 years 20

Second, William Holbert, Chemung, N. Y..... 10

SINGLE HORSES IN HARNESS WITH REFERENCE TO SPEED IN WALKING (NOT LESS THAN FIVE MILES PER HOUR).

First prize, Miss Emma G. Rogers, Elmira, N. Y.; chestnut, 15.3, 8 years $15

No. 11.—JACKS AND MULES.

PAIR OF MULES TWO YEARS OLD.

First prize, Charles Prince & Son, Catharine, N. Y.; bred in Kentucky................ $10

ARDIL B. RAYMOND, *New York*.
GEORGE H. BROWN, *Millbrook, N. Y.*

CLASS III.—SHEEP, SWINE AND POULTRY.

No. 12.—FAT SHEEP.

LONG-WOOLED, OVER TWO YEARS OLD.

First prize, Jurian Winne, Bethlehem Centre, N. Y................................ $5

No. 13.—LONG-WOOLED SHEEP.

LEICESTERS.

RAMS OVER TWO YEARS OLD.

First prize, Jurian Winne, Bethlehem Centre, N. Y................................ 15

Second, W. L. & W. Rutherford, Waddington, N. Y................................ 10

Third, Jurian Winne, Bethlehem Centre, N. Y., 5

YEARLING RAMS.

First prize, W. L. & W. Rutherford, Waddington, N. Y.......... 15

Second, Jurian Winne, Bethlehem Centre, N.Y., 10

Third, Jurian Winne, Bethlehem Centre, N. Y., 5

PENS OF (THREE) RAM LAMBS.

First prize, Jurian Winne, Bethlehem Centre, N. Y................................ 10

PENS OF (THREE) EWES OVER TWO YEARS OLD.

First prize, W. L. & W. Rutherford, Waddington, N. Y........................... 15

Second, Jurian Winne, Bethlehem Centre, N.Y., 10

PENS OF (THREE) YEARLING EWES.

First prize, Richard Gibson, London, Canada . 15

Second, Jurian Winne, Bethlehem Centre, N.Y., 10

PENS OF (THREE) EWE LAMBS.

First prize, W. L. & W. Rutherford, Waddington, N. Y........................... 10

Second, Jurian Winne, Bethlehem Centre, N.Y., 5

COTSWOLDS.

RAMS OVER TWO YEARS OLD.

First prize, Jacob Albright, Etna, N. Y.; Duke of Gloster............................ 15

Second, Edwin Thorne, Thorndale, N. Y..... 10

Third, Chase & Harris, Rochester, N. Y..... 5

YEARLING RAMS.

First prize, Edwin Thorne, Thorndale, N. Y... $15

Second, Edwin Thorne, Thorndale, N. Y...... 10

Third, Edwin Thorne, Thorndale, N. Y....... 5

PENS OF (THREE) RAM LAMBS.

First prize, Chase & Harris, Rochester, N. Y.. 10

Second, Chase & Harris, Rochester, N. Y..... 5

Commended, R. W. Cameron, New York.

PENS OF (THREE) EWES OVER TWO YEARS.

First prize, Edwin Thorne, Thorndale, N. Y... 15

Second, Chase & Harris, Rochester, N. Y..... 10

Third, Chase & Harris, Rochester, N. Y...... 5

PENS OF (THREE) YEARLING EWES.

First prize, Edwin Thorne, Thorndale, N. Y... 15

Second, R. W. Cameron, New York........... 10

Third, Chase & Harris, Rochester, N. Y...... 5

PENS OF (THREE) EWE LAMBS.

First prize, R. W. Cameron, New York....... 10

Second, Chase & Harris, Rochester, N. Y..... 5

Commended, Chase & Harris, Rochester, N. Y.

LINCOLNS.

RAMS OVER TWO YEARS OLD.

First prize, Richard Gibson, London, Canada; imported.............................. 15

YEARLING RAMS.

First prize, Richard Gibson, London, Canada; imported.............................. 15

PENS OF (THREE) EWES OVER TWO YEARS.

First prize, Richard Gibson, London, Canada; imported.............................. 15

PENS OF (THREE) YEARLING EWES.

First prize, Richard Gibson, London, Canada; imported.............................. 15

Mr. Richard Gibson, of London, Canada, was the only exhibitor in this class, but the want in numbers was more than made up in quality. Mr. Gibson is entitled to much credit for his skill in selecting and importing such really fine specimens of the breed.

JOHN PURVIS, *Madrid, N. Y.*
JOHN BANKS, *Bainbridge, N. Y.*

No. 14.—MIDDLE WOOLED SHEEP.

SOUTH DOWNS.

RAMS OVER TWO YEARS.

First prize, George H. Brown, Millbrook, N. Y., $15

Second, George H. Brown, Millbrook, N. Y... 10

Third, Charles Prince & Son, Catharine, N. Y., 5

YEARLING RAMS.

First prize, George H. Brown, Millbrook, N. Y., $15

Second, Jacob Albright, Etna, N. Y........... 10

Third, Joseph Juliand, Bainbridge, N. Y...... 5

PENS OF (THREE) EWES OVER TWO YEARS OLD.

First prize, George H. Brown, Millbrook, N. Y.. $15

Second, George H. Brown, Millbrook, N. Y... 10

Third, George H. Brown, Millbrook, N. Y.... 5

PENS OF (THREE) YEARLING EWES.

First prize, George H. Brown, Millbrook, N. Y.. 15

Second, George H. Brown, Millbrook, N. Y... 10

Third, James Suffern, Elmira, N. Y.......... 5

PENS OF (THREE) EWE LAMBS.

First prize, Joseph Juliand, Bainbridge, N. Y.. 10

SHROPSHIRE DOWNS.

RAMS TWO YEARS OLD.

First prize, L. C. Fish, Otego, N. Y.......... 15

PENS OF (THREE) EWES.

First prize, L. C. Fish, Otego, N. Y.; 2 years old 15

COMMENDED.

L. C. Fish, Otego, N. Y.; Shropshire Down ewe lambs and ram lambs.

Your committee respectfully recommend that in Shropshire Downs, the list of premiums be extended as in other breeds. The competition was not large, but there were some very fine sheep on exhibition.

RALPH H. AVERY, *Canastota, N. Y.*
JOSEPH HILTON, *New Scotland, N. Y.*

No. 15.—MERINOS.

A.—BRED FOR FINENESS OF WOOL.

RAMS OVER TWO YEARS OLD.

First prize, William Chamberlain, Red Hook, N. Y................................ $15

Second, William Chamberlain, Red Hook, N. Y., 10

Third, Carl Heyne, Red Hook, N. Y.......... 5

PENS OF (THREE) RAM LAMBS.

First prize, Carl Heyne, Red Hook, N. Y..... 10

Second, William Chamberlain, Red Hook, N.Y., 5

PENS OF (THREE) EWES TWO YEARS OLD.

First prize, William Chamberlain, Red Hook, N. Y.. 15

Second, William Chamberlain, Red Hook, N. Y., 10

Third, Carl Heyne, Red Hook, N. Y......... 5

PENS OF (THREE) YEARLING EWES.

First prize, William Chamberlain, Red Hook, N. Y.............................. ...... $15

Second, Carl Heyne, Red Hook, N. Y......... 10

Third, William Chamberlain, Red Hook, N. Y.. 5

PENS OF (THREE) EWE LAMBS.

First prize, William Chamberlain, Red Hook, N. Y 10

Second, Carl Heyne, Red Hook, N. Y......... 5

B.—BRED FOR WEIGHT OF FLEECE.

RAMS OVER TWO YEARS OLD.

First prize, Lusk & Townsend, Batavia and Pavilion Centre, N. Y................... 15

Second, William Chamberlain, Red Hook, N. Y., 10

YEARLING RAMS.

First prize, S. B. Lusk, Batavia, N. Y........ 15

Second, Peter & George F. Martin, East Rush, N. Y.................................. 10

Third, Lusk & Townsend, Batavia and Pavilion Centre, N. Y.......................... 5

PENS OF (THREE) RAM LAMBS.

First prize, Peter & George F. Martin, East Rush, N. Y............................ 10

Second, Lusk & Townsend, Batavia and Pavilion Centre, N. Y.................... 5

PENS OF (THREE) EWES TWO YEARS OLD.

First prize, Lusk & Townsend, Batavia and Pavilion Centre, N. Y.................. 15

Second, S. B. Lusk, Batavia, N. Y............ 10

Third, Peter & George F. Martin, East Rush, N. Y................ 5

PENS OF (THREE) YEARLING EWES.

First prize, Peter & George F. Martin, East Rush, N. Y.......................... 15

Second, Lusk & Townsend, Batavia and Pavilion Centre, N. Y.......................... 10

Third, Peter & George F. Martin, East Rush, N. Y.................................. 5

PENS OF (THREE) EWE LAMBS.

First prize, S. B. Lusk, Batavia, N. Y........ 10

Second, Peter & George F. Martin, East Rush, N. Y.................................. 5

C. HORACE HUBBARD, *Springfield, Vt.*
ARBA CAMPBELL, *Owego, N. Y.*

No. 16.—SWINE.

LARGE BREED.

BOARS ONE YEAR OLD.

First prize, Brodie, Son & Converse, Rural Hill and Woodville, N. Y................... $15

BOARS SIX MONTHS OLD AND LESS THAN ONE YEAR.

First prize, A. L. Thomas, Cuba, N. Y....... $15

Second, Brodie, Son & Converse, Rural Hill and Woodville, N. Y....... 10

BREEDING SOWS TWO YEARS OLD.

First prize, Brodie, Son & Converse, Rural Hill and Woodville, N. Y....... 15

Second, A. L. Thomas, Cuba, N. Y....... 10

SOWS ONE YEAR OLD.

First prize, A. L. Thomas, Cuba, N. Y....... 15

Second, Brodie, Son & Converse, Rural Hill and Woodville, N. Y....... 10

SOW PIGS OVER SIX MONTHS OLD.

First prize, Brodie, Son & Converse, Rural Hill and Woodville, N. Y....... 15

Second, A. L. Thomas, Cuba, N. Y....... 10

PENS OF (FIVE) PIGS UNDER SIX MONTHS OLD.

First prize, A. L. Thomas, Cuba, N. Y....... $15

Second, C. P. Root, Butternuts, N. Y.... 10

SMALL WHITE BREED.

BOARS TWO YEARS OLD.

First prize, William B. Dinsmore, Staatsburgh, N. Y....... 15

BOARS ONE YEAR OLD.

First prize, William B. Dinsmore, Staatsburgh, N. Y....... 15

BOARS SIX MONTHS OLD AND LESS THAN ONE YEAR.

First prize, S. M. Thomas, Cuba, N. Y.; Suffolk and Cheshire....... $15

BREEDING SOWS TWO YEARS OLD.

First prize, William B. Dinsmore, Staatsburgh, N. Y....... 15

Second, Frank D. Curtis, Charlton, N. Y....... 10

SOWS ONE YEAR OLD.

First prize, T. L. Harison, Morley, N. Y....... 15

Second, William B. Dinsmore, Staatsburgh, N. Y....... 10

SOW PIGS OVER SIX MONTHS OLD.

First prize, S. M. Thomas, Cuba, N. Y....... 15

PENS OF (FIVE) PIGS UNDER SIX MONTHS OLD.

First prize, F. D. Curtis, Charlton, N. Y....... $15

Second, Wm. B. Dinsmore, Staatsburgh, N. Y. 10

S. S. WHITMAN, *Little Falls, N. Y.*
JURIAN WINNE, *Bethlehem Centre, N. Y.*

SMALL BLACK BREED.

BOARS TWO YEARS OLD.

First prize, Joseph Harris, Rochester, N. Y.; "Adam"....... $15

Second, Joseph Harris, Rochester, N. Y.; "General Grant"....... 10

BOARS ONE YEAR OLD.

First prize, B. F. Denison, Geneseo, N. Y....... 15

Second, Joseph Harris, Rochester, N.Y.; "Willie's Favourite, 2d"....... 10

BOARS SIX MONTHS OLD AND LESS THAN ONE YEAR.

First prize, Wodell & Deuel, Millbrook, N, Y.; "Cardiff"....... $15

Second, Joseph Harris, Rochester, N. Y....... 10

BREEDING SOWS TWO YEARS OLD.

First prize, B. F. Denison, Geneseo, N. Y....... 15

Second, Wodell & Deuel, Millbrook, N. Y.; "Clothilde"....... 10

SOWS ONE YEAR OLD.

First prize, B, F. Denison, Geneseo, N. Y....... 15

Second, Joseph Harris, Rochester, N. Y....... 10

SOW PIGS OVER SIX MONTHS.

First prize, Joseph Harris, Rochester, N. Y... 15

Second, B. F. Denison, Geneseo, N. Y....... 10

PENS OF (FIVE) PIGS UNDER SIX MONTHS.

First prize, Wodell & Deuel, Millbrook, N. Y., 15

Second, Joseph Harris, Rochester, N. Y....... 10

EXTRA AWARD.

M. C. Weld, Closter, N. J.; Neapolitan boar pig....... 15

BERKSHIRES.

BOARS TWO YEARS OLD.

First prize, William Crozier, Northport, N. Y.; "Prince William"....... 15

Second, R. R. C. Bordwell, Penn Yan, N. Y.; "Chieftain"....... 10

BOARS ONE YEAR OLD.

First prize, W. Simpson, Jr., New Hudson, N. Y....... 15

Second, F. D. Curtis, Charlton, N. Y....... 10

BOARS SIX MONTHS OLD AND LESS THAN ONE YEAR.

First prize, William Crozier, Northport, N. Y.; Cannon Ball....... $15

Second, William Crozier, Northport, N. Y.; Brother to Cannon Ball....... 10

SOWS TWO YEARS OLD.

First prize, Benjamin Fellows, Clifton, N. Y.... $15

Second, William Crozier, Northport, N. Y.; Jess 2d.............................. 10

SOWS ONE YEAR OLD.

First prize, William Crozier, Northport, N. Y., 15

Second, Frank D. Curtis, Charlton, N. Y...... 10

SOW PIGS OVER SIX MONTHS.

First prize, William Crozier, Northport, N. Y.; Exquisite.............................. 15

Second, William Crozier, Northport, N. Y.; Modesty.............................. 10

PENS OF (FIVE) PIGS UNDER SIX MONTHS OLD.

First prize, Edwin Thorne, Thorndale, N. Y., 15

In the class of small black swine, M. C. Weld, of Closter, N. J., entered a very fine Neapolitan boar pig, imported with a sow, last April, in an Italian vessel direct from Naples, Italy. The Society offers no premiums for this breed of pigs; your committee, consequently, much to their regret, could not award the boar any prize. But, inasmuch as boars of this breed were imported into England many years ago, and crossed with the coarse, slow-maturing, unthrifty native Essex females, and thus brought the improved Essex to its present great value and perfection, we think a discretionary premium of at least $15 should be awarded to Mr. Weld, for being at the trouble and expense of exhibiting this choice animal at the present State Fair. The Neapolitan breed is very thrifty, matures early and fattens quickly. Its meat is admitted to be more delicate than that of any other breed of swine, closely resembling in flavour that of a very fat young chicken.

As others now think of importing more Neapolitan pigs, and as it may, consequently, soon become an established breed with us, your committee recommend that the same range of premiums be awarded to them hereafter, as to the Essex, as they may be of great assistance in improving the breeds of swine throughout our country.

Essex swine are a purely black breed, or rather they are sometimes of a slaty, or dark rich plum colour; and the Neapolitans are of a dark slate or plum colour. They may, however, be properly enough classed as a "black breed." But inasmuch as the Berkshires are invariably flecked, or lightly spotted with white, sometimes intermixed with a little buff or sandy colour, we think they should not be classed under the head of "black." It will be enough simply to class them as Berkshires, or, if necessary to distinguish, we would recommend saying, of black or deep rich plum colour, flecked with white or buff. We do not like the term spotted, which is sometimes applied to this breed, as this implies a nearly equal mixture of different colours, which is not the present style of breeding Berkshires.

Your committee would recommend the breeders to pay as much attention as possible to fine soft hair and quality of flesh in their stock. Thick coarse hair and bristles are rather objectionable on all choice improved breeds of swine.

A. B. ALLEN, *New York*.
H. C. HOFFMAN, *Horseheads, N. Y.*

NO. 17.—POULTRY.

TRIOS LIGHT BRAHMAS.

First prize, John H. Hall, Catharine, N. Y.... $5

Second, John H. Hall, Catharine, N. Y....... 3

TRIOS DARK BRAHMAS.

First prize, G. H. Warner, New York Mills, N. Y.................................. 5

Second, D. G. Eacker, Havana, N. Y......... 3

TRIOS BUFF, LEMON OR CINNAMON COCHINS.

First prize, John H. Hall, Catharine, N. Y.... 5

Second, G. H. Warner, New York Mills, N. Y., 3

TRIOS PARTRIDGE OR GROUSE COCHINS.

First prize, G. H. Warner, New York Mills, N. Y.................................. 5

Second, John H. Hall, Catharine, N. Y....... 3

TRIOS WHITE COCHINS.

First prize, J. Y. Bicknell, Westmoreland, N. Y., 5

Second, Bordwell Brothers, Penn Yan, N. Y.. 3

TRIOS COLOURED DORKINGS.

Second, G. H. Warner, New York Mills, N. Y., 3

TRIOS SILVER GRAY DORKINGS.

First prize, G. H. Warner, New York Mills, N. Y.................................. 5

TRIOS WHITE DORKINGS.

First prize, J. Y. Bicknell, Westmoreland, N.Y., 5

Second, G. H. Warner, New York Mills, N. Y., 3

TRIOS DOMINIQUES.

First prize, O. Howland, Auburn, N. Y. 5

Second, O. Howland, Auburn, N. Y.......... 3

TRIOS SPANGLED GOLDEN HAMBURGHS.

First prize, J. Y. Bicknell, Westmoreland, N. Y., 5

Second, J. Y. Bicknell, Westmoreland, N. Y.. 3

TRIOS SPANGLED SILVER HAMBURGHS.

First prize, Robert Bell, West Brighton, N. Y., $5

Second, Bordwell Brothers, Penn Yan, N. Y.. 3

TRIOS BLACK HAMBURGHS.

Second prize, J. Y. Bicknell, Westmoreland, N. Y. ... 3

TRIOS BLACK SPANISH.

First prize, J. Y. Bicknell, Westmoreland, N. Y., 5

Second, O. Howland, Auburn, N. Y. ... 3

TRIOS WHITE LEGHORNS (YELLOW LEGS AND SINGLE COMBS).

First prize, Bordwell Brothers, Penn Yan, N. Y., $5

Second, J. Y. Bicknell, Westmoreland, N. Y.. 3

TRIOS CRÈVE CŒURS.

First prize, J. Y. Bicknell, Westmoreland, N. Y., 5

TRIOS HOUDANS.

First prize, G. H. Warner, New York Mills, N. Y. ... 5

Second, J. Y. Bicknell, Westmoreland, N. Y.. 3

TRIOS POLISH.

First prize, J. Y. Bicknell, Westmoreland, N.Y.; golden spangled ... 5

Second, O. Howland, Auburn, N. Y.; silver spangled ... 3

PAIRS BLACK BREASTED RED GAMES.

First prize, Chidsey & White, Elmira, N. Y... 5

Second, J. Y. Bicknell, Westmoreland, N. Y.. 3

PAIRS BROWN BREASTED RED GAMES.

First prize, Chidsey & White, Elmira, N. Y... 5

PAIRS DUCKWING GAMES.

First prize, Richard B. Dean, Elmira, N. Y... 5

Second, J. Y. Bicknell, Westmoreland, N. Y... 3

PAIRS PILE GAMES.

First prize, J. Y. Bicknell, Westmoreland. N. Y., 5

PAIRS OTHER APPROVED, WELL-BRED GAMES.

First prize, Chidsey & White, Elmira, N. Y.; Irish blues ... 5

Second, J. Y. Bicknell, Westmoreland, N. Y.; white ... 3

PAIRS RED GAME BANTAMS.

First prize, G. H. Warner, New York Mills, N. Y. ... 5

Second, W. Simpson, Jr., New Hudson, N. Y., 3

PAIRS DUCKWING GAME BANTAMS.

First prize, G. H. Warner, New York Mills, N. Y. ... $5

TRIOS GOLD LACED SEBRIGHT BANTAMS.

First prize, Chidsey & White, Elmira, N. Y... 5

Second, J. Y. Bicknell, Westmoreland, N. Y... 3

TRIOS BLACK BANTAMS.

First prize, J. Y. Bicknell, Westmoreland, N. Y., 5

Second, Chidsey & White, Elmira, N. Y. 3

TRIOS OTHER BANTAMS.

Second, Andrew Wilson, Elmira, N. Y.; white, 3

PAIRS BRONZE TURKEYS.

First prize, William Simpson, Jr., New Hudson, N. Y. ... 5

Second, O. Howland, Auburn, N. Y. ... 3

PAIRS BLACK TURKEYS.

First prize, O. Howland, Auburn, N. Y. ... 5

PAIRS WHITE GUINEA FOWLS.

First prize, Bordwell Brothers, Penn Yan, N. Y. ... 3

PAIRS PEA FOWLS.

First prize, Andrew B. Raynor, Waverly, N. Y., 3

Second, Jesse Lyon, Catharine, N. Y. ... 2

PAIRS TOULOUSE GEESE.

First prize, S. M. Thomas, Cuba, N. Y. ... 5

Second, W. Simpson, Jr., New Hudson, N. Y.. 3

PAIRS BREMEN GEESE.

First prize, Bordwell Brothers, Penn Yan, N. Y., 5

PAIRS WHITE CHINA GEESE.

First prize, Bordwell Brothers, Penn Yan, N. Y., 5

PAIRS WILD GEESE.

First prize, Charles H. Roy, Wells, Penn..... 5

Second, Lewis Roy, Wells, Penn ... 3

PAIRS ROUEN DUCKS.

First prize, J. Y. Bicknell, Westmoreland, N. Y., 5

Second, Bordwell Brothers, Penn Yan, N. Y... 3

PAIRS AYLESBURY DUCKS.

First prize, J. Y. Bicknell, Westmoreland, N.Y., 5

Second, Bordwell Brothers, Penn Yan, N. Y.. 3

PAIRS CAYUGA DUCKS.

First prize, J. Y. Bicknell, Westmoreland, N. Y., 5

Second, O. Howland, Auburn, N. Y. ... 3

Pairs Topknot Ducks.

First prize, O. Howland, Auburn, N. Y....... $5

Pairs Musk or Muscovy Ducks.

First prize, Edward Ward, Elmira, N. Y...... 3

Pigeons.

Pairs Pouters.

First prize, W. Simpson, Jr., New Hudson, N. Y.............................. 3

Second, G. H. Warner, New York Mills, N. Y., 2

Tumblers.

First prize, W. Simpson, Jr., New Hudson, N. Y.............................. 3

Pairs Barbs.

First prize, W. Simpson, Jr., New Hudson, N. Y.............................. 3

Pairs Turbits (winged).

First prize, W. Simpson, Jr., New Hudson, N. Y.............................. 3

Pairs Fantails.

First prize, G. H. Warner, New York Mills, N. Y.............................. 3

Collections Fancy Pigeons.

First prize, W. Simpson, Jr., New Hudson, N. Y.......................... 5

Rabbits.

Lop-eared or Madagascar Rabbits.

Bucks of any Colour.

First prize, A. M. Halsted, Rye, N. Y........ 3

Second, Bordwell Brothers, Penn Yan, N. Y., 2

Does of any Colour.

First prize, A. M. Halsted, Rye, N. Y........ 3

Second, Bordwell Brothers, Penn Yan, N. Y., 2

Self Coloured Bucks.

First prize, A. M. Halsted, Rye, N. Y........ 3

Self Coloured Does.

First prize, A. M. Halsted, Rye, N. Y........ 3

Broken Coloured Bucks.

First prize, A. M. Halsted, Rye, N. Y........ 3

Broken Coloured Does.

First prize, A. M. Halsted, Rye, N. Y........ 3

Common Rabbits.

Bucks.

First prize, A. M. Halsted, Rye, N. Y........ 2

Does.

First prize, A. M. Halsted, Rye, N. Y........ $2

Highly Commended.

A. M. Halsted, Rye, N. Y.; rabbit hutches.

M. C. Weld, *Closter, N. J.*
D. W. Herstine, *Philadelphia, Penn.*

Class IV.—IMPLEMENTS AND MACHINERY.

No. 18.—Implements and Machines, First List.

Stationary Steam Engines.

Henry C. Haskell, Albany, N. Y.; thirty-horse power high pressure steam engine, 12 inch bore, 24 inch stroke, $2,000. Also a forty-horse power locomotive boiler, with Clark's registering steam gauge and Murrill & Keizer's automatic damper regulator............. Bronze Medal.

Portable Steam Engines.

B. W. Payne & Sons, Corning, N. Y.; five-horse power portable engine, 3,500 lbs., $500.........................Bronze Medal.

Note.—*Premiums for the other machines, usually embraced in this list, were not offered this year, no field trials being had.*

Extra Awards.

Ames Plow Co., Boston, Mass.; patent hard steel for ploughs...Certificate of Highest Merit.

Albert Kane, Newport, N. Y.; portable harrow, Certificate of Highest Merit.

Smith & Dixon, Port Byron, N. Y.; stamped plate steel knife guards for harvesting machines.................Certificate of Merit.

James Armstrong, Toledo, O.; Armstrong's water heater and filter, lime extractor and steam condenser for steam engine......... Certificate of Highest Merit.

No. 18.—Implements, Second List.

Hay and Cattle Scales.

The Jones Scale Works, Binghamton, N Y.; four ton hay scale ....Bronze Medal.

Machines for Separating Mixtures of Grain and Cleaning and Assorting Grain.

James Bradner, Pine Creek, N. Y.; New York separator and bagger...........Bronze Medal.

Buckwheat Scourers.

D. D. Brewster, Oneonta, N. Y.; Brewster's patent buckwheat refiner.......Bronze Medal.

Power Feed or Chaff Cutters.

Thomas W. Hotchkiss, Elmira, N. Y.; Howland's patent improved feed mill for grinding or chopping feed........... Bronze Medal.

Power Corn Shellers.

Caleb J. Legg, Penn Yan, N. Y.; Legg's patent corn sheller...................Bronze Medal.

Hand Corn Shellers.

Otis B. Hyde, Owego, N. Y.........Bronze Medal.

Portable Saw Mills.

H. & F. Blandy, Zanesville, Ohio; Blandy's double circular saw mill........Bronze Medal.

Farm Grain Mills.

Joseph Sedgebeer, Painesville, O.; Nonpareil grinding mill..................Bronze Medal.

Cider Mills.

Ames Plow Co., Boston, Mass.; Eaton's cider mill...........................Bronze Medal.

Robert Butterworth, Trenton, N. J..Bronze Medal.

Cider Making Apparatus.

Alexander Bradley & Dunning, Syracuse, N. Y.; No. 2 cider press for pressing pomace..... Bronze Medal.

Pumps for Farm Use.

William C. Barker, Horseheads, N. Y.; elastic rubber bucket chain pump............... Certificate of Highest Merit.

Substitutes for Pumps.

Miller & Wentworth, Seneca Falls, N. Y.; Wentworth's patent water drawer, with patent crank which does not turn when the bucket goes down..........Bronze Medal.

Washing Machines.

Robert K. Tomlinson, Brownsburg, Pa.; The Farmer's washing and wringing machine.. Bronze Medal.

Apparatus for Steaming Food for Stock.

E. E. Sill, Rochester, N. Y.; Eagle steamer and cauldron ....Bronze Medal.

P. P. Mast & Co., Springfield, O.; Anderson's agricultural steamer.......Certificate of Merit.

Steam Pumps.

Vischer & La France, Elmira, N. Y.; patent rotary power pumps...........Bronze Medal.

Portable Gas Machines.

D. W. Seeley, Cedar Hill, N. Y.; double acting hydro-carbon gas machine............... Certificate of Highest Merit.

Extra Awards.

William H. Field, Port Chester, N. Y.; Curtis' patent scythe holder...........Bronze Medal.

Warner & Green, Cambridge, N. Y.; Lane's improved patent lever set circular saw mill, Certificate of Highest Merit.

No. 20.—Wood Working Machinery.

Planing and Matching Machines.

Frank & Co., Buffalo, N. Y.; pony planer and matcher.......................Bronze Medal.

Surface Planing Machines.

Frank & Co., Buffalo, N. Y.........Bronze Medal.

Steam Scroll Sawing Machines.

Jerome S. Mosely, Syracuse, N. Y...Bronze Medal.

Du Bois & Bengler, Williamsport, Pa.; Bengler's patent scroll saw..........Certificate of Merit.

Hand Scroll Sawing Machines.

William Weaver & Co., Greenwich, N. Y.; Weaver's hand scroll sawing machine, and combined for boring and planing. Bronze Medal.

Extra Award.

S. W. Hall, Elmira, N. Y.; universal fencing machine.................Certificate of Merit.

No. 22.—Tools and Hand Implements for the Farm and Garden.

Grain Cradles.

First prize, William R. Cooper, Elmira, N. Y.; iron brace............................ $5

Second, Russell Morgan, Fayetteville, by M. E. Viele, agent, Albany, N. Y................ 3

Hay Forks.

First prize, Batcheller & Sons, Wallingford, Conn.; by M. E. Viele, agent, Albany, N. Y................................ 5

Second, E. P. Shumway & Co., Leominster, Mass.; by Booth, Dounce, Rose & Co., agents, Elmira, N. Y.................... 3

Manure Forks.

First prize, E. P. Shumway & Co., Leominster, Mass.; by Booth, Dounce, Rose & Co., agents, Elmira, N. Y................... 5

Second, E. P. Shumway & Co., Leominster, Mass.; by Booth, Dounce, Rose & Co., agents, Elmira, N. Y................... 3

Spading Forks.

First prize, E. P. Shumway & Co., Leominster Mass.; by Booth, Dounce, Rose & Co., agents, Elmira, N. Y................... 5

Grass Scythes.

First prize, Eagle Co., Riverton, Conn.; by M. E. Viele, agent, Albany, N. Y........... 5

Hoes.

First prize, Tuttle Manufacturing Co., Naugatuck, Conn.; by M. E. Viele, agent, Albany, N. Y 5

Spades.

First prize, O. Ames & Son, Easton, Mass.; by M. E. Viele, agent, Albany, N. Y..... 5

Shovels.

First prize, O. Ames & Son, Easton, Mass.; by M. E. Viele, agent, Albany, N. Y 5

POTATO FORKS.

First prize, E. P. Shumway & Co., Leominster, Mass.; by Booth, Dounce, Rose and Co., agents, Elmira, N. Y. $5

POTATO HOOKS.

First prize, Tuttle Manufacturing Co., Naugatuck, Conn.; by M. E. Viele, agent, Albany, N. Y. 5

SETS OF DRAINING SPADES.

First prize, O. Ames & Son, Easton, Mass.; by M. E. Viele, agent, Albany, N. Y. 5

EXHIBITIONS OF EDGE TOOLS.

First prize, Elmira Nobles Manufacturing Co., Elmira, N. Y.; exhibition of axes and drawing knives 5

EXHIBITIONS OF SAWS.

First prize, Andrews & Burbage, Elmira, N. Y., 5

EXHIBITIONS OF AUGERS AND BORING IMPLEMENTS.

First prize, Elmira Nobles Manufacturing Co., Elmira, N. Y. $5

EXHIBITIONS OF FARM AND GARDEN TOOLS AND IMPLEMENTS.

First prize, John G. Burritt, Elmira, N. Y.... $10

EXTRA AWARDS.

J. W. Williams & Son, Chagrin Falls, O.; Eagle pruning tools for trimming trees. Certificate of Merit.

O. T. Bush, Oneonta, N. Y.; iron fence. Certificate of Merit.

No. 23.—WAGGONS, CARRIAGES, SADDLERY, AND ARTICLES OF WHEELWRIGHTS' AND BLACKSMITHS' WORK.

ROCKAWAY, BRETT OR CHARIOTEE.

First prize, James Ewing, Elmira, N. Y.; double seated, piano box carriage $10

LIGHT ROAD WAGGONS.

First prize, Herrick & Seeley, Elmira, N. Y.... 10

U. S. Hall, Watkins, N. Y ....Certificate.

TOP BUGGYS AND PHAETONS.

First prize, James Ewing, Elmira, N. Y....... 5

Second, James Ewing, Elmira, N. Y 3

OPEN BUGGYS.

First prize, Earnest Brothers, Wayne, N. Y... 10

Second, Herrick & Seeley, Elmira, N. Y...... 5

BUSINESS WAGGONS.

First prize, John T. Ayres, Elmira, N. Y.; platform spring waggon, two seats 10

Second, James Ewing, Elmira, N. Y.; platform spring business waggon $5

FAMILY WAGGONS.

First prize, Herrick & Seeley, Elmira, N. Y... 10

Second, Fitzgerald & Kinne, Cortland, N. Y... 5

DOUBLE SLEIGHS.

First prize, Moore & Ross, Owego, N. Y....... 10

DOUBLE FARM WAGGONS.

First prize, Lee T. Swartwout, Locke, N. Y... 10

ASSORTMENTS OF WAGGON WOOD WORK.

First prize, Charles H. Adams, Union Springs, N. Y .... Bronze Medal.

Second, Smith, Newman & Co., Millport, N. Y. $5

ROLLERS FOR GENERAL USE.

First prize, The Manley Land Roller Manufacturing Co., Potsdam, N. Y 5

Second, C. Bartholomew, Etna, N. Y.; land roller with attachment 3

CARRIAGE HARNESS.

First prize, Merwin & Dickinson, Elmira, N. Y.; gold plated 5

Second, Merwin & Dickinson, Elmira, N. Y.; silver plated 3

SINGLE HARNESS.

First prize, Charles A. Willis, Elmira, N. Y... 5

Second, Merwin & Dickinson, Elmira, N. Y... 3

FARM HARNESS.

First prize, Charles A. Willis, Elmira, N. Y... 5

MEN'S SADDLES.

First prize, Charles A. Willis, Elmira, N. Y... 5

Second, William A. Brooks, Elmira, N. Y..... 3

No. 24.—STOVES, ETC.

COOKING STOVES FOR WOOD.

First prize, Daniel E. Paris & Co., Troy, N. Y.; Mansard Cook ....Bronze Medal.

Second, Bussey, McLeod & Co., Troy, N. Y.; Mammoth ....Certificate.

COOKING STOVES FOR COAL.

First prize, Swett, Quimby & Perry, Troy, N. Y.; New Empire ....Bronze Medal.

Second, Daniel E. Paris & Co., Troy, N. Y.; Mansard Cook ....Certificate.

COOKING STOVES FOR EITHER COAL OR WOOD.

First prize, Hicks & Wolfe, Troy, N. Y.; Superb ....Bronze Medal.

Second, S. H. Ransom & Co., Albany, N. Y.; Modern Vulcan ....Certificate.

PARLOUR STOVES FOR COAL.

First prize, William Doyle, Albany, N. Y..... Bronze Medal.

Second, Backus, Button & Co., Albany, N. Y., Certificate.

HALL STOVES FOR COAL.

First prize, Treadwell Stove Co., Albany, N. Y.; Laurel Wreath................Bronze Medal.

Second, S. H. Ransom & Co., Albany, N. Y.; Light House.....................Certificate.

D. M. GREENE, *Troy, N. Y.*
ANSON A. SWEET, *Syracuse, N. Y.*
LYMAN BENEDICT, *Hoosick Falls, N. Y.*

No. 21.—DAIRY IMPLEMENTS.

CHURNS FOR LARGE DAIRIES.

Saffell & Baldwin, Tiffin, O.........Bronze Medal.

CHURNS FOR SMALL DAIRIES.

Saffell & Baldwin, Tiffin, O.........Bronze Medal.

MILK PANS.

First prize, Douglas & Stilson, Franklin, N. Y.; Orange county milk pan, with double and single rack........................... $3

Second, Townsend & Hyde, Malone, N. Y.; Jewett's patent milk pans............... 2

PAILS OR FIRKINS FOR TRANSPORTING BUTTER IN HOT WEATHER.

First prize, George N. Palmer, Greene, N. Y.; refrigerating butter pail................. $5

EXTRA AWARDS.

Wheaton Loomis, Brisbin, N. Y.; Cunningham's patent butter worker......Commended.

J. M. Paine, Cattaraugus county, N. Y.; set of milk pans.....................Commended.

A. P. Bussey, Westernville, N. Y.; National milk deodorizing strainer and cooler...... Certificate of Highest Merit.

J. H. Smiley, by Edward Owen, agent, Deposit, N. Y.; churn thermometer......... .... Certificate of Highest Merit.

T. D. CURTIS, *Utica, N. Y.*
SETH BONFOY, *West Winfield, N. Y.*

CLASS V.—FARM PRODUCE.

No. 25.—GRAINS, SEEDS, HOPS—GROWN IN 1872.

WHITE WINTER WHEAT.

First prize, Robert Bell, West Brighton, N. Y.; Diehl $10

Second, Horace Ames, Moscow, N. Y.; Diehl, 5

RED WINTER WHEAT.

First prize, George Chamberlain, Southport, N. Y.................................. 10

Second, Milton H. Ottley, Phelps, N. Y....... $5

RED SPRING WHEAT.

First prize, Nathan Vary, Horseheads, N. Y.; China tea.............................. 10

WHITE OATS.

First prize, William Newton, Henrietta, N. Y.; Excelsior 10

BLACK OR GRAY OATS.

Second prize, John Stryker, Rome, N. Y.; Norway 5

TWO-ROWED SPRING BARLEY.

First prize, S. M. Thomas, Cuba, N. Y....... 10

FOUR-ROWED SPRING BARLEY.

First prize, Robert Bell, West Brighton, N. Y., 5

YELLOW INDIAN CORN, SHELLED.

First prize, J. S. Holbert, Chemung, N. Y.... 10

Second, Milton H. Ottley, Phelps, N. Y....... 5

WHITE INDIAN CORN, SHELLED.

First prize, J. S. Holbert, Chemung, N. Y..... 10

Second, Reuben E. Noble, Elmira, N. Y...... 5

FIELD BEANS, LARGE.

First prize, J. S. Holbert, Chemung, N. Y.... 10

FIELD BEANS, SMALL.

First prize, Horace Ames, Moscow, N. Y...... 10

Second, S. M. Thomas, Cuba, N. Y.......... 5

FIELD PEAS, LARGE.

First prize, S. M. Thomas, Cuba, N. Y....... 10

FIELD PEAS, SMALL.

First prize, Horace Ames, Moscow, N. Y...... 10

Second, S. M. Thomas, Cuba, N. Y.......... 5

BUCKWHEAT.

First prize, S. M. Thomas, Cuba, N. Y....... 5

Second, A. D. Griswold, Southport, N. Y..... 3

TIMOTHY SEED.

Second prize, John Benedict, Wellsburgh, N.Y., 3

SORGHUM SEED.

First prize, George Chamberlain, Southport, N. Y................................ 5

TWENTY-FIVE SEED EARS YELLOW CORN, EIGHT-ROWED.

First prize, William Newton, Henrietta, N. Y., $5

Second, A. D. Griswold, Elmira, N. Y........ 3

TWENTY-FIVE SEED EARS YELLOW CORN, TWELVE-ROWED.

First prize, John Stryker, Rome, N. Y........ $5

Second, William Newton, Henrietta, N. Y..... $3

TWENTY-FIVE SEED EARS WHITE CORN.

First prize, William Holbert, Chemung, N. Y., 5
Second, Reuben E. Moss, Elmira, N. Y....... 3

TWENTY-FIVE EARS EARLY SWEET CORN.

First prize, Thomas M. Jewett, Elmira, N. Y., 5
Second, Crosman Brothers, Rochester, N. Y.. 3

TWENTY-FIVE EARS LATE SWEET CORN.

First prize, Reuben E. Moss, Elmira, N. Y.... 5
Second, William Holbert, Chemung, N. Y..... 3

BALES OF HOPS.

First prize, George Maby, Elmira, N. Y...... 10
Second, W. Simpson, Jr., New Hudson, N. Y., 5

No. 26.—VEGETABLES.

CABBAGES.

First prize, Ebenezer Warner, Breeseport, N. Y., 3
Second, Crosman Brothers, Rochester, N. Y... 2

LETTUCE.

First prize, Crosman Brothers, Rochester, N.Y., 3
Second, Mrs. J. T. Van Namee, Pittstown, N.Y., 2

TURNIPS.

First prize, George Chamberlain, Southport, N. Y........................... 3
Second, George S. McCann, Elmira, N. Y..... 2

MANGOLDS AND BEETS.

First prize, Crosman Brothers, Rochester, N. Y., 3
Second, Judson Williams, Elmira, N. Y....... 2

ORANGE CARROTS.

First prize, Crosman Brothers, Rochester, N. Y., 3
Second, George S. McCann, Elmira, N. Y..... 2

WHITE CARROTS.

First prize, William H. Johnson, Elmira, N. Y., 3
Second, Crosman Brothers, Rochester, N. Y.. 2

PARSNIPS.

First prize, Crosman Brothers, Rochester, N. Y., 3
Second, A. D. Griswold, Southport, N. Y..... 2

SALSIFY.

First prize, Mrs. W. H. Graves, Blossvale, N.Y., 3
Second, A. D. Griswold, Southport, N. Y..... 2

KOHL-RABI.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y................... 3
Second, Crosman Brothers, Rochester, N. Y... 2

ONIONS.

First prize, Crosman Brothers, Rochester, N. Y., $3
Second, Reuben E. Moss, Elmira, N. Y....... 2

TOMATOES.

First prize, Crosman Brothers, Rochester, N. Y., 3
Second, Judson Wilson, Elmira, N. Y........ 2

EGG PLANTS.

First prize, Crosman Brothers, Rochester, N. Y., 3

GARDEN BEANS.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y................................ 3
Second, Crosman Brothers, Rochester, N. Y... 2

PEPPERS.

First prize, Crosman Brothers, Rochester, N.Y., 3
Second, M. E. Myers, Charlton, N. Y........ 2

SQUASHES.

First prize, Crosman Brothers, Rochester, N. Y., 3
Second, Charles Pullar, Elmira, N. Y......... 2

FIELD PUMPKINS.

First prize, John Stryker, Rome, N. Y... ... 3
Second, J. S. Holbert, Chemung, N. Y........ 2

SWEET POTATOES.

First prize, George E. Wickham, Havana, N. Y., 3
Second, Miles C. Baldwin, Chemung, N. Y.... 2

POTATOES, EARLY VARIETIES.

First prize, Reuben E. Moss, Elmira, N. Y.... 10
Second, Crosman Brothers, Rochester, N. Y... 5

POTATOES, LATE VARIETIES.

First prize, Reuben E. Moss, Elmira, N. Y.... 10
Second, B. C. Trumble, Elmira, N. Y........ 5

POTATOES, STOCK FEEDING VARIETIES.

First prize, B. C. Trumble, Elmira, N. Y...... 10
Second, Crosman Brothers, Rochester, N. Y.. 5

GENERAL COLLECTIONS OF POTATOES FOR ALL PURPOSES.

First prize, B. C. Trumble, Elmira, N. Y...... $20
Second, Reuben E. Moss, Elmira, N. Y....... 10

COLLECTIONS OF VEGETABLES.

First prize, Crosman Brothers, Rochester, N. Y., 20

No. 27.—FLOUR, ETC.

WHITE WHEAT FLOUR, WITH SAMPLE OF THE WHEAT AND STATEMENT OF THE QUANTITY USED TO MAKE THE BARREL OF FLOUR.

Samuel Hotchkin, Elmira, N. Y............. $10

SPRING WHEAT FLOUR, WITH SAMPLE OF THE WHEAT AND STATEMENT OF THE QUANTITY USED TO MAKE THE BARREL OF FLOUR.

Samuel Hotchkin, Elmira, N. Y. $10

STARCH FROM CORN.

Abram Stone, Stanwix, N. Y. 5

STARCH FROM WHEAT.

Mrs. Charity Hakes, Stanwix, N. Y. 5

HOMINY.

Mrs. W. H. Graves, Blossvale, N. Y. 5

FARINA.

Mrs. C. M. Stone, Blossvale, N. Y. 5

OATMEAL.

Mrs. W. H. Graves, Blossvale, N. Y. 5

PEARLED BARLEY.

Mrs. W. H. Graves, Blossvale, N. Y. 5

Very fine displays of Mammoth and other varieties of corn were exhibited by R. C. McNeil, Campville, N. Y., William Bartholomew, and T. V. Maxon, Adams, N. Y.

Only one specimen of celery was on exhibition, and that was not worthy of a premium.

George Cooper, of Rochester, exhibited a fine collection of vegetables, including celery, cauliflowers, cabbages, lettuce, turnips, carrots, parsnips, salsify, and egg plants, not regularly entered, but we desire to give them honourable mention. We likewise commend the display by Crosman Brothers, Rochester, N. Y., under the head of extra entries.

The Land Department of the Northern Pacific Railroad exhibited specimens of grain, vegetables, fruit, etc., grown along the line of their road in the States of Minnesota, Dakotah, and Oregon, that are exceedingly fine and meritorious.

The Burlington and Missouri River Railroad likewise exhibited a very fine collection of farm produce grown along their road, which is worthy of special notice.

WILLIAM A. WARD, *Elmira, N. Y.*
GRENVILLE M. INGALSBE, *Sandy Hill, N. Y.*

No. 28.—BUTTER.

THIRTY POUNDS JUNE BUTTER.

First prize, J. S. Holbert, Chemung, N. Y. $20
Second, A. B. Benham, Ithaca, N. Y. 15
Third, Abram Stone, Stanwix, N. Y. 10

THIRTY POUNDS OF BUTTER MADE AT ANY TIME.

First prize, Isaac Morris, Elmira, N. Y. 20
Second, Frank Winkley, Belmont, N. Y. $15
Third, A. M. Bennett, Chateaugay, N. Y. 10

FIVE POUNDS OF BUTTER IN ONE POUND ROLLS.

First prize, J. S. Holbert, Chemung, N. Y. 10
Second, Almon Gratsinger, Elmira, N. Y. 5

No. 29.—CHEESE.

AMERICAN CHEESES—FACTORY OR OTHER, OVER ONE YEAR OLD, NOT LESS THAN FORTY POUNDS WEIGHT.

First prize, Clear Spring Factory, Fredonia, N. Y. $20
Second, M. E. Myers, Charlton, N. Y. 15

AMERICAN CHEESES—FACTORY OR OTHER, LESS THAN ONE YEAR OLD.

First prize, Clear Spring Factory, Fredonia, N. Y. $20
Second, W. Simpson, Jr., New Hudson, N. Y., 15
Third, M. E. Myers, Charlton, N. Y. 10

FIVE CHEESES.

First prize, Clear Spring Factory, Fredonia, N. Y. 20
Second, W. Simpson, Jr., New Hudson, N. Y.; factory 15
Third, M. E. Myers, Charlton, N. Y.; factory. 10

THREE FACTORY-MADE CHEESES.

First prize, Clear Spring Factory, Fredonia, N. Y. 15
Second, W. Simpson, Jr., New Hudson N. Y. . 10
Third, Jonas S. Van Duzer, Horseheads, N. Y. 5

THREE PREPARED RENNETS.

First prize, Mrs. W. H. Graves, Blossvale, N.Y., 10
Second, Abram Stone, Stanwix, N. Y. 5

COMMENDED.

C. P. Root, Butternuts, N. Y.; imitation English cheese, made in July, from new milk without cooking.

No. 30.—BREAD, SUGAR, ETC.

WHEATEN BREAD.

First prize, Wells Taylor, Elmira, N. Y. 5
Second, Mrs. J. N. Rogers, Elmira, N. Y. 3

RYE BREAD.

First prize, Mrs. H. C. Hoffman, Horseheads, N. Y. 5
Second, Mrs. Joseph Hoffman, Elmira, N. Y. .. 3

INDIAN, OR RYE AND INDIAN, BREAD.

First prize, Mrs. H. C. Hoffman, Horseheads, N. Y. 5
Second, Mrs. W. H. Graves, Blossvale, N. Y. . 3

MAPLE SYRUP.

First prize, A. L. Thomas, Cuba, N. Y....... $5

PRESERVED FRESH FRUITS.

First prize, Andrew Suffern, Elmira, N. Y.... 5

Second, James McCann, Elmira, N. Y........ 3

PICKLES IN VINEGAR.

First prize, George E. Wickham, Havana, N. Y., 5

Second, Mrs. H. C. Hoffman, Horseheads, N. Y., 3

DRIED APPLES.

First prize, Mrs. Joseph Hoffman, Elmira, N. Y.............................. 5

Second, Mrs. R. A. Thomas, Alfred Centre, N. Y.............................. 3

DRIED PEACHES.

First prize, George E. Wickham, Havana, N. Y., 5

Second, Mrs. W. H. Graves, Blossvale, N. Y.. 3

DRIED WHORTLEBERRIES.

First prize, Mrs. W. H. Graves, Blossvale, N. Y.............................. 5

DRIED RASPBERRIES.

First prize, Mrs. W. H. Graves, Blossvale, N. Y.............................. 5

Second, George E. Wickham, Havana, N. Y... 3

BOX HONEY BY ONE COLONY THIS SEASON.

First prize, A. D. Griswold, Southport, N. Y.. 20

TEN POUNDS OF BOX HONEY.

First prize, P. Miller, Fredonia, N. Y......... 5

Second, A. D. Griswold, Southport, N. Y..... 3

FIVE POUNDS OF EXTRACTED OR STRAINED HONEY.

First prize, Mrs. W. H. Graves, Blossvale, N. Y.............................. $5

Second, J. H. Hadsell, Breesport, N. Y....... 3

Hugh M. Moore, Elmira, N. Y.; improved geared rotary honey extractor, for separating honey from the comb. Works well, and deserves favourable mention.

T. D. CURTIS, *Utica, N. Y.*
SETH BONFOY, *West Winfield, N. Y.*

CIDER VINEGAR.

First prize, James McCann, Elmira, N. Y..... $5

Second, Mrs. G. W. Holbert, Elmira, N. Y.... 3

No. 32.—DOMESTIC MANUFACTURES.

PAIRS WOOLLEN BLANKETS.

First prize, Abram Stone, Stanwix, N. Y..... 5

ALL-WOOL HORSE BLANKETS.

First prize, John Stryker, Rome, N. Y....... 5

TEN YARDS WOOLLEN CLOTH.

Second prize, Mrs. W. H. Graves, Blossvale, N. Y.............................. $3

TEN YARDS WOOLLEN FLANNEL.

First prize, Mrs. C. M. Stone, Blossvale, N. Y., 5

Second, Mrs. Charity Hakes, Stanwix, N. Y... 3

TEN YARDS FLANNEL, COTTON WARP.

First prize, Mrs. W. H. Graves, Blossvale, N. Y., 5

Second, Mrs. C. S. Vary, Horseheads, N. Y... 3

TEN YARDS LINSEY-WOOLSEY.

First prize, Mrs. Charity Hakes, Stanwix, N.Y., 5

Second, Mrs. W. H. Graves, Blossvale, N. Y.. 3

TEN YARDS WOOLLEN CARPET.

First prize, Mrs. C. Burk, Fassetts, Penn..... 5

TEN YARDS RAG CARPET.

First prize, John Knipp, Caton, N. Y........ 5

Second, Mrs. C. Burk, Fassetts, Penn........ 3

HEARTH RUGS.

First prize, Mrs. John Miller, Southport, N. Y., 5

Second, Mrs. H. P. Spaulding, Elmira, N. Y.. 3

TEN YARDS LINEN CLOTH.

Second prize, Mrs. C. M. Stone, Blossvale, N. Y., 3

TEN YARDS LINEN DIAPER.

Second prize, Mrs. W. H. Graves, Blossvale, N. Y.............................. 3

TEN YARDS LINEN KERSEY.

Second prize, Mrs. C. M. Stone, Blossvale, N. Y.............................. 3

TEN YARDS TOW CLOTH.

First prize, Mrs. W. H. Graves, Blossvale, N.Y., 5

TEN YARDS LINEN BAGGING.

Second prize, Mrs. W. H. Graves, Blossvale, N. Y.............................. 3

KNIT BED SPREADS.

First prize, *Mrs. Sarah C. Martemus, Elmira, N. Y.............................. 3

Second, Mrs. P. C. Young, Elmira, N. Y...... 2

WHITE WORKED OR QUILTED BED SPREADS.

First prize, Mrs. L. B. Goodsell, Bartlett, N. Y., 3

Second, Mrs. Luman Rice, Elmira, N. Y...... 2

BALMORAL PETTICOATS.

First prize, Mrs. C. M. Stone, Blossvale, N. Y., 3

* Protested on the ground that the article was not made within the year as required by the regulations.

WOOLLEN KNIT STOCKINGS.

First prize, Mrs. C. Burk, Fassetts, Penn..... $3

Second, Mrs. W. H. Graves, Blossvale, N. Y.. 2

WOOLLEN KNIT MITTENS.

First prize, Mrs. C. S. Vary, Horseheads, N. Y. 3

Second, Mrs. W. H. Graves, Blossvale, N. Y.. 2

WOOLLEN FRINGE MITTENS.

First prize, Mrs. Theodore Gallaway, Susquehanna Depot, Penn.................... 3

Second, Mrs. C. M. Stone, Blossvale, N. Y.... 2

LINEN OR COTTON KNIT STOCKINGS.

First prize, Mrs. L. B. Goodsell, Bartlett, N. Y. 3

Second, Mrs. W. H. Graves, Blossvale, N. Y... 2

LINEN SEWING THREAD.

First prize, Mrs. W. H. Graves, Blossvale, N. Y., 3

Second, Mrs. C. M. Stone, Blossvale, N. Y.... 2

EXTRA AWARD.

Mrs. H. M. Badger, Elmira, N. Y.; fancy needle work 10

COMMENDED.

Mrs. Mary E. Crans, Elmira, N. Y.; wax flowers.

Nettie M. Goodsell, Elmira, N. Y.; embroidery.

Miss Rida Haight, Elmira, N. Y.; affghan.

Mrs. W. F. Meres, Elmira, N. Y.; ornamental moss work.

Dela Morrow, Elmira, N. Y.; carriage affghan.

Charles Pullar, Elmira, N. Y.; ornamental burr and moss work.

Miss Eloise Tolles, Elmira, N. Y.; thread tidies.

William L. Ward, Elmira, N.Y.; quilted bed spread.

Miss L. K. Wilcox, Elmira, N. Y.; wreath of worsted flowers.

Miss Ella Young, Elmira, N. Y.; wreath of wax flowers.

JAMES W. MAIRS, *Schenectady, N. Y.*
Z. P. RUGGLES, *Fort Edward, N. Y.*

CLASS VI.—FLOWERS, PLANTS, DESIGNS AND FRUITS.

No. 33.—FLOWERS—PROFESSIONAL LIST.

CUT FLOWERS.

First prize, James Vick, Rochester, N. Y..... $10

Second, Mrs. S. A. Humphries, Elmira, N. Y.. 5

COLLECTIONS OF DAHLIAS.

First prize, James Vick, Rochester, N. Y..... 6

Second, Crosman Brothers, Rochester, N. Y... 3

TWENTY-FOUR DAHLIAS.

First prize, James Vick, Rochester, N. Y..... $3

TWELVE DAHLIAS.

First prize, James Vick, Rochester, N. Y...... 3

Second, Crosman Brothers, Rochester, N. Y... 1

AMERICAN SEEDLING DAHLIAS.

James Vick, Rochester, N. Y................ 1

EXHIBITIONS OF ROSES.

First prize, Ellwanger & Barry, Rochester, N.Y., 6

TWENTY-FOUR ROSES.

First prize, Ellwanger & Barry, Rochester, N.Y., 5

TWELVE ROSES.

Second prize, Mrs. S. A. Humphries, Elmira, N. Y.................................. 1

EXHIBITIONS OF CARNATIONS.

James Vick, Rochester, N. Y................ 3

EXHIBITIONS OF PHLOXES.

First prize, James Vick, Rochester, N. Y..... 5

TWELVE PHLOXES.

First prize, James Vick, Rochester, N. Y..... 3

SEEDLING PHLOXES.

James Vick, Rochester, N. Y................ 1

EXHIBITIONS OF VERBENAS.

First prize, James Vick, Rochester, N. Y..... 5

Second, Mrs. S. A. Humphries, Elmira, N. Y.. 3

TWELVE VERBENAS.

First prize, James Vick, Rochester, N. Y..... 3

Second, George Evenden, Elmira, N. Y....... 1

THREE AMERICAN SEEDLING VERBENAS.

James Vick, Rochester, N. Y................ 1

EXHIBITIONS OF GERMAN ASTERS.

First prize, James Vick, Rochester, N. Y..... 3

EXHIBITIONS OF PANSIES.

First prize, James Vick, Rochester, N. Y..... 3

Second, Mrs. S. A. Humphries, Elmira, N. Y.. 1

TEN WEEK STOCKS.

First prize, James Vick, Rochester, N. Y..... 3

Second, Mrs. S. A. Humphries, Elmira, N. Y.. 1

GLADIOLUS.

First prize, James Vick, Rochester, N. Y..... 3

Second, Mrs. S. A. Humphries, Elmira, N. Y.. 1

No. 34.—FLOWERS—AMATEUR LIST.

CUT FLOWERS.

First prize, Mrs. Harriet E. King, Corning, N.Y. 10

Second, Greve P. Rawson, Almond, N. Y. ... 5

EXHIBITIONS OF DAHLIAS.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y. $6

TWELVE DAHLIAS.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y. 3

SIX DAHLIAS.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y. 2

EXHIBITIONS OF ROSES.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y. 6

EXHIBITIONS OF VERBENAS.

First prize, Mrs. Harriet E. King, Corning, N. Y. 5

Second, Mrs. J. T. Van Namee, Pittstown, N. Y. 3

Gratuity to Grove P. Rawson, Almond 3

TWELVE VERBENAS.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y. 3

SIX VERBENAS.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y. 2

SEEDLING VERBENAS.

Grove P. Rawson, Almond, N. Y. 1

EXHIBITIONS OF PHLOXES.

Mrs. Harriet E. King, Corning, N. Y. 5

ANNUAL PHLOXES.

Mrs. H. P. Spaulding, Elmira, N. Y. 2

PERENNIAL PHLOXES.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y. 2

SEEDLING PHLOXES.

Mrs. J. T. Van Namee, Pittstown, N. Y. 1

GERMAN ASTERS.

First prize, Mrs. Harriet E. King, Corning, N.Y. 3

Second, Mrs. J. T. Van Namee, Pittstown, N. Y. 1

PANSIES.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y. 3

TEN WEEK STOCKS.

First prize, Grove P. Rawson, Almond, N. Y. . 3

EVERLASTING FLOWERS.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y. 3

Second, Grove P. Rawson, Almond, N. Y. 1

Gratuity to Mrs. R. A. Thomas, Alfred Centre, N. Y. $1

NO. 35.—FLOWERS—GENERAL LIST.

COLLECTIONS OF (TWENTY) HOUSE PLANTS IN POTS.

First prize, George Evenden, Elmira, N. Y.... $10

Second, Mrs. S. A. Humphries, Elmira, N. Y. 5

TEN PLANTS IN POTS.

First prize, George Evenden, Elmira, N. Y.... 5

Second, Mrs. S. A. Humphries, Elmira, N. Y. . 3

FLORAL DESIGNS OR ORNAMENTS.

First prize, Mrs. S. A. Humphries, Elmira, N. Y. 5

Second, Grove P. Rawson, Almond, N. Y. 3

Gratuity to Mrs. R. A. Thomas, Alfred Centre, N. Y. 2

Gratuity to Mrs. J. T. Van Namee, Pittstown, N. Y. 2

HAND BOUQUETS.

First prize, Mrs. S. A. Humphries, Elmira, N. Y. 5

Second, Mrs. Harriet E. King, Corning, N. Y., 3

PARLOUR BOUQUETS.

First prize, Mrs. Harriet E. King, Corning, N. Y. 5

Second, George Evenden, Elmira, N. Y. 3

BASKET BOUQUETS.

First prize, Mrs. S. A. Humphries, Elmira, N. Y. 5

Second, Mrs. J. M. Tillman, Elmira, N. Y.... 3

VICK'S SPECIAL PRIZES.

SPECIAL FLORAL PRIZES OFFERED BY JAMES VICK, OF ROCHESTER, N. Y., FOR FLOWERS GROWN FROM SEEDS PURCHASED FROM HIM.

GENERAL COMPETITION.

CUT FLOWERS. Grove P. Rawson, Almond, N. Y. 20

PHLOX DRUMMONDII.—Mrs. Harriet E. King, Corning, N. Y. 10

ASTERS.—Mrs. Harriet E. King, Corning, N Y. 10

BALSAMS.—Grove P. Rawson, Almond, N. Y.. 10

DIANTHUS.—Mrs. Harriet E. King, Corning, N. Y. 10

PANSIES.—Mrs. J. M. Tillman, Elmira, N. Y., 10

STOCKS.—Grove P. Rawson, Almond, N. Y... 10

EVERLASTING FLOWERS.—Mrs. R. A. Thomas, Alfred Centre, N. Y. 10

FOR FLOWERS GROWN BY PERSONS UNDER TWENTY YEARS OF AGE.

CUT FLOWERS.—Grove P. Rawson, Almond, N. Y. 10

PHLOX DRUMMONDII.—Grove P. Rawson, Almond, N. Y........ 5

ASTERS.—Grove P. Rawson, Almond, N. Y... $5

BALSAMS.—Grove P. Rawson, Almond, N. Y.. 5

DIANTHUS.—Grove P. Rawson, Almond, N. Y., 5

STOCKS.—Grove P. Rawson, Almond, N. Y... 5

EVERLASTING FLOWERS.—Grove P. Rawson, Almond, N. Y........ 5

No. 36.—FRUITS—PROFESSIONAL LIST.

FORTY VARIETIES OF APPLES.

First prize, Ellwanger & Barry, Rochester, N. Y........ 15

TWENTY VARIETIES OF APPLES.

First prize, Charles Pullar, Elmira, N. Y..... 10

TWENTY VARIETIES OF PEARS.

First prize, Ellwanger & Barry, Rochester, N. Y........ 15

FIFTEEN VARIETIES OF PEARS.

First prize, Ellwanger & Barry, Rochester, N. Y........ 10

TWELVE VARIETIES OF PLUMS.

First prize, Ellwanger & Barry, Rochester, N. Y........ 5

SIX VARIETIES OF PLUMS.

First prize, Ellwanger & Barry, Rochester, N. Y........ 3

SINGLE VARIETIES OF PLUMS.

Crosman Brothers, Rochester, N. Y.......... 1

TWELVE QUINCES.

First prize, Ellwanger & Barry, Rochester, N. Y........ 3

Second, Crosman Brothers, Rochester, N. Y... 2

EXHIBITIONS OF NATIVE GRAPES.

First prize, Pleasant Valley Wine Co., Hammondsport, N. Y........ 6

Second, Ellwanger & Barry, Rochester, N. Y.. 3

SINGLE VARIETIES OF GRAPES.

First prize, Pleasant Valley Wine Co., Hammondsport, N. Y.; Iona........ 2

Second, L. M. Ferris & Son, Poughkeepsie, N. Y.; Walter........ 1

SINGLE VARIETIES OF WATERMELONS.

Crosman Brothers, Rochester, N. Y.......... 1

No. 37.—FRUITS—AMATEUR LIST.

TWENTY VARIETIES OF APPLES.

First prize, Ira D. Crandall, Alfred Centre, N. Y........ 12

Second, A. G. Owens, Big Flats, N. Y........ 8

Gratuity to J. C. Cook, Ithaca, N. Y......... 5

Gratuity to Robert Bell, West Brighton, N. Y., 3

FIFTEEN VARIETIES OF APPLES.

First prize, Ira D. Crandall, Alfred Centre, N. Y........ $10

Second, J. C. Cook, Ithaca, N. Y............ 5

Gratuity to Robert Bell, West Brighton, N. Y., 4

TEN VARIETIES OF APPLES.

First prize, Robert Bell, West Brighton, N. Y., 5

Second, James R. Conklin, Elmira, N. Y...... 3

FIFTEEN VARIETIES OF PEARS.

First prize, J. C. Cook, Ithaca, N. Y......... 12

Second, Robert Bell, West Brighton, N. Y.... 8

TEN VARIETIES OF PEARS.

First prize, Robert Bell, West Brighton, N. Y., 10

Second, J. C. Cook, Ithaca, N. Y............ 5

SIX VARIETIES OF PEARS.

First prize, Robert Bell, West Brighton, N. Y., 8

Second, Miles C. Baldwin, Chemung, N. Y.... 4

TEN VARIETIES OF PEACHES.

First prize, J. C. Cook, Ithaca, N. Y......... 5

Second, George E. Wickham, Havana, N. Y... 3

SINGLE VARIETIES OF PEACHES.

George Sidney, Elmira, N. Y................ 2

TWELVE QUINCES.

First prize, Robert Bell, West Brighton, N. Y., 3

Second, A. R. Frost, Elmira, N. Y........... 2

EXHIBITIONS OF NATIVE GRAPES.

First prize, J. C. Cook, Ithaca, N. Y......... 6

SINGLE VARIETIES OF NATIVE GRAPES.

J. C. Cook, Ithaca, N. Y.................. 2

SINGLE VARIETIES OF FOREIGN GRAPES.

A. S. Diven, Elmira, N. Y.................. 2

SINGLE VARIETIES OF WATERMELONS.

Reuben E. Moss, Elmira, N. Y.............. 1

EXHIBITIONS OF MUSKMELONS.

Second prize, Reuben E. Moss, Elmira, N. Y.. 2

SINGLE VARIETIES OF MUSKMELONS.

Reuben E. Moss, Elmira, N. Y.............. 1

E. S. RAND, JR., *Boston, Mass.*

C. L. ALLEN, *Brooklyn, N. Y.*

In making the main awards of premiums on Fruits and Flowers, I desire to say that the most of the labour was performed by my associates, Messrs. Rand and Allen, during my absence.

Subsequently I took the book of entries, with the notes of their awards, and carefully examined the

exhibits, and have to accord my associates good judgment in most cases.

I desire, also, as a feature of instruction, to name varieties of a few of the flowers, etc., that received premiums. In flowers, the best dahlias were named as follows, viz.: Golden Eagle, Caroline Quetterall, Provost, Bird of Passage, John Neville Keynes, Princess, Grand Sultan, James Greive, John Harrison, Rising Sun, High Sheriff, Mary Lander. Among the cockscombs, exhibited by Vick, was a new Japanese, much more delicate in the crests of its flowers, yet compact, and of a rich, deep bright scarlet colour; besides, its foliage and stems partake more or less of the colour of the flower.

Among the apples, Porter, Baldwin, Gravenstein, Jonathan, Fameuse, R. I. Greening, Fall Pippin and Cayuga Red Streak rank among those in which both quality, size and profit rule.

Among pears, Bartlett, Beurre Clairgeau, Duchesse d'Angouleme, Beurre Bosc, Beurre d'Anjou, Seckel, Louise Bonne de Jersey, Onondaga and Vicar of Winkfield rank first for all purposes.

Among melons, Sill's Hybrid, a new variety of nutmeg, with a creamy yellow flesh and very thin rind, is one of great value. Skillman's fine netted also yet to day holds a first place as one of the best of the green fleshed varieties. A new hybrid watermelon was shown, but its value not well known. It is perhaps well to say, that the Rattlesnake watermelon of the South has proved, where grown North this past year, one of the best.

A plate of apples was shown as "Seneca county Pippin." It is doubtful if they do not prove, "Alexander."

F. R. Elliott, *Cleveland, O.*

Class VII.—MISCELLANEOUS.

The Rubber Paint Company, of Cleveland, O., are entitled to special commendation for their idea of mixing the article of India rubber with a paint that in its variety of colours and strength of body brings its usefulness into extended operation.

Charles O. Peck, Pittsfield, Mass., has bestowed not only care and skill, but ornament on the Polar Star Refrigerator, which seems to the Committee to bring to the family the power of preserving in best use its food, and to make it independent of daily supply. The Committee are glad to notice the increasing taste for the pleasant in form that this article indicates.

Both the Cabinet Pipe Organ Company, and Cole, Carpenter, Coleman & Co., of Syracuse, make the people their debtors by the organs which they prepare. It is very gratifying to the Committee to know that in our own State our ingenious artificers are thus enabling our public institutions and churches to possess a bold, graceful, and sweet music.

Messrs. Bement & Davenport, of Elmira, add to the excellence of this fair by the pictures of Mr. Waters which they exhibit, with the deep, rich gilding of the frames as their own share in these works of art.

Messrs. Fitch & Demars, of Elmira, present a collection of wall papers and stationery. The Committee desire to be considered as making grateful mention of the work of all who, like these last two named firms, contributed to make the home of the farmer so attractive as to add to the happiness of home life.

Messrs. W. E. Hart & Son attracted the special notice of the Committee by their exquisite collection of stair rods, which, in connection with the beautiful patterns of carpets, are to make the staircase a real beauty in each dwelling.

A very admirable chair was shown by E. S. Mead & Co., of Addison. It was an American work, massive, in ample dimension, and such as would give the farmer a real luxury after a hard day's work.

Mr. H. A. Slossen, of Binghamton, presented a fire-proof paint, which is represented as durable and efficient to such degree, as the Committee hope may be fully realized, for if it is all, by severe trial, that it is represented to be, it is a protection of such long abiding good, as to give it special commendation.

Mr. Henderson, of Rochester, has, in his exhibition, his share toward accomplishing protection for the hoof of the horse, a most commendable effort. He also exhibits devices for lessening the wear of the collar and the buckle in harness.

The Committee specially commend the great ingenuity of the Dana Bickford Knitting Machine. The examination of it was not extended, but the machine seemed to do its work in a degree of instant use, and with such present application of power, and to have in such small space occupied and obliterated so thoroughly the old hand work, that it was as a revolution. It deserves a distinct approval by the Society.

The Committee welcome the exhibition of architectural drawings made by Corliss McKenney, of Binghamton, because it is of the objects most to be desired, that the homes of our people should in each year be so formed as to combine the greatest beauty with the most of order, and, particularly, the most of convenience. If our time and space permitted, the Committee would say much more of that, as among the leading features of the Society's efforts.

Messrs. Booth, Dounce, Rose & Co., show variety of carriage hardware, to an extent claimed to be the

answer to all demands of the carriage builder. This Committee see in that, and commend it by this mention, the enterprise of our merchants in concentrating in convenient limits the wants of a strong business.

Messrs. C. D. & J. A. Westlake, exhibit a pretty little contrivance to assist the infant child in learning to walk. It has the commendatory opinion of four physicians, as "a valuable acquisition to the nursery." The Committee have an enduring confidence in nature as the best of teachers in the use of life's powers, but would speak kindly of this arrangement, especially with its professional recommendation.

Jones' Springbed is made in the most admirable manner with respect to workmanship, and resists motion in all directions by means of counter braces, except in the vertical, in which motion is desired; it appeared to us worthy of the highest commendation.

French trimmer, binder and hemmer, exhibited by Leslie Ruffler Co., Chicago, Ill., seemed to us to supply a want of the sewing machine not hitherto supplied; it bends, points and circles admirably, and in fact all sorts of trimmings may be put on by it, and has the merit of being adjustable to all existing machines.

McKay's Patent Self-winding and Balancing Curtain Fixture performed its work in a very satisfactory manner. Price, $12 per doz. Elmira, N. Y.

J. E. Larkin, photographer, exhibited admirable life-size pictures of several well known citizens.

The ironing table "Young America," exhibited by Robinson & Harris, is worthy of high commendation. We have never seen anything so complete for this purpose. There is a muslin protection by which delicate dresses are shielded from dust and dirt while being ironed, and all the adjustments are made in the most convenient manner.

William Bundy, Elmira, N. Y., exhibited some horse shoes of different sizes well shaped and admirably hammered.

A. Krowe, Elmira, N. Y., also exhibited some horse shoes made of excellent material in the most workmanlike manner.

Richard's Walking Motion Treadle for sewing machines, in which the feet work alternately instead of simultaneously, which is claimed to be made easier than the ordinary mode. Goodyear & Hunter, Binghamton, N. Y.

L. E. Walker, publisher of stereoscopic views, Warsaw, N. Y., has made very fine stereoscopic views of the scenery of the line of the Erie railroad, which will satisfy the wants of tarry-at-home travellers. The views are well selected, and the finish is in all respects admirable.

Adjustable Treadle Co., No. 64, Cortland st., N. Y., have invented an adjustable treadle, in which the axis of the treadle is made to coincide in position with the ankle joint. When the foot is fatigued in one position, the muscles are relieved by a change.

American Buttonhole Overseaming and Complete Sewing Machine. This worked a button hole in our presence admirably and with great rapidity; it also sews all other stitches with facility by a slight and easily made adjustment of the gearing.

L. M. Bates, Toledo, Ohio, exhibits a spring bed, called the "Manhattan." Each spring is left to its own individual motion, being only fastened at the base. A cotton duck covering is adjusted by means of hooks to the frame, which may be taken off and cleaned at pleasure; the springs are said to be of steel.

Elie Lavoie exhibits very fine specimens of natural hair work, consisting of wigs, switches, curls, etc.

Elmira Co-operative Boot and Shoe Co., exhibits some excellent specimens of boots and shoes.

Original Howe Sewing Machines improved, exhibited by C. S. Todd, of Rochester, manager. These are too well known to require description.

Singer Manufacturing Co., also exhibited their machines to which the same remark may be applied.

Davis Sewing Machine Co., Watertown, N. Y., exhibited by C. W. McNish, Horseheads, N. Y. Price, $60. Its peculiarity is the vertical feed, and claims several more valuable peculiarities.

A. E. Cooper, Cooper's Plains, N. Y., exhibited rustic rocking chairs which would not rock over, strong and handsome, and what is more to the purpose, easy to the back and loins. Price, from $6 to $12.

Weed's Family Favorite Sewing Machine, exhibited by J. K. Tillotson, Elmira, N. Y. This is much approved by hosts of ladies, but we do not feel competent to decide upon its comparative merits.

Victor Sewing Machine Co. Its peculiarity is a self-setting needle. It also claims many other advantages which we cannot properly decide upon.

W. B. Hatch, spring bed. The upper surfaces of the springs are free, the wire is made of the best rolled iron, and by means of a ratchet and toggle joint, the head can be raised up so that an invalid can be brought to a sitting position.

The undersigned, the Committee appointed to examine such articles offered for exhibition, but under the usage of the Society, not subjects of premium as were shown in the Class VII, Miscellaneous, report the discharge of their duty, regretting that in a field so extensive, their examination of valuable and ingenious articles could not have been with more of time and thoroughness. They are earnest in the expression of the opinion, that many of these articles are of a class which in their value to the community, might justly be entitled to detailed reward of premium. They hope it may be in the Society's judgment to present to the exhibitors, a certificate of merit.

WILLIAM H. BOGART, *Aurora, N. Y.*
JOHN STANTON GOULD, *Hudson, N. Y*

THE JOURNAL

OF

The New-York State Agricultural Society.

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State Agricultural Rooms.

The Office of the Society is in the New Agricultural Hall corner of State and Lodge streets, Albany.

ANNUAL MEETING.

JANUARY 22 AND 23, 1873.

The Annual Meeting and election will be held at the Capitol, in the city of Albany, on Wednesday, the 22d of January, at noon. The meeting will be continued, as usual, during the Thursday following. The following gentlemen have consented to be present and contribute papers: A. F. Liautard, M. D., President of the New York College of Veterinary Surgeons (on the epizoötic influenza); Charles A. Goessman, Ph. D., Professor of Chemistry in the Massachusetts State Agricultural College; Dr. E. Lewis Sturtevant, of Massachusetts (on "The Claims of the Ayrshire Cow upon the Dairy Farmer"), and X. A. Willard, Esq., M. A. The usual winter exhibition will take place on Thursday, January 23d. Lists of prizes offered for fruits, etc., and for crops. experiments, etc., will be sent on application.

REPORT OF COMMITTEE ON WINES AT THE STATE FAIR, AT ELMIRA, OCTOBER, 1872.

The most numerous samples were exhibited by the Urbana and the Pleasant Valley Wine Companies, of Hammondsport, Steuben County. N. Y. On examination of the wines of both these companies—located near to each other, and working grapes from identical soils and positions, and of the same varieties—they are found to be much alike in flavor and quality, apparently differing only in the processes of their manufacture and the ages at which they are tested.

For some years past the choice brands of both companies have been constantly improving, and obtained a deserved celebrity in the estimation of their consumers throughout New York and in neighbouring States. These are gratifying facts. not only encouraging to the wine makers, as a testimony to their continuous skill and perseverance, but as positive evidence of the ability in certain selections of our soil and climate to produce superior wines, and of various kinds.

Your committee in their reports of past years, have given their testimony to the superiority of the sparkling "Gold Seal" and "Imperial" brands of the Urbana, and also of the "Paris Exposition," and "Great Western" brands of the Pleasant Valley Company; and we repeat our good opinion of them on this occasion, but as we feel obliged to give a preference, we award the silver medal to the "Great Western," of the Pleasant Valley Company, as on the whole the most perfect of the samples.

In the several varieties of "dry" still wines exhibited by both these companies, we were much gratified with the excellent samples of "Port" and "Claret" which they had produced, as well as good imitations of Sherry. On a careful examination we awarded the first prize of a silver medal to the dry still wines of the Urbana Company. Sweet wines were also shown in several excellent samples by both parties, of which those of the Pleasant Valley Company seemed, on the whole, a trifle superior to the others. The silver medal is awarded to them. A superior sample of dry wine from the Walter Grape was exhibited by the Pleasant Valley Company, showing that this new grape "promises well" as a choice wine variety.

An excellent sample of Grape Brandy was produced by each one of the above companies. Had they been of equal age, a choice might not have been readily made. But its age by a year or two of time was in favour of the Pleasant Valley sample, and the prize of

a silver medal was awarded for it. To the other one of the Urbana company we award a silver medal as being equally good were the additional age given to mature it. We understand that the demand for these brandies is so large, and the quantity produced by both companies is so limited, that they cannot keep it until of sufficient age to test its quality fairly with the best of the *older* specimens from the French vineyards.

Taken altogether, this exhibition has been the most varied in character, and superior in quality of wines yet submitted to the Society. The varieties of grapes from which they have been made were more numerous than ever before, and the manufacturers are continuously making further investigations of the separate merits and values of these varieties. Some they are occasionally discarding, while as often introducing other hitherto untried varieties; yet, through their close selections of fruit and experience in working them, they are evidently raising the standard of their production. It is, however, a settled point that the admixture of the *must* of several different kinds of grapes produces the best "sparkling" wines. Of the *proportions* of the different "musts," it is not our province to inquire, nor do we know all their names, nor any other secret beyond that they are *pure extracts of the grape*.

CORDIALS.

Miss Helen Bovier, Bath, Blackberry, Commended.
Miss Helen Bovier, Bath, Currant, Commended.
Miss Helen Bovier, Bath, Pie Plant, Commended.
Mrs. G. W. Hulburt, Elmira, Currant, Commended.

LEWIS F. ALLEN, *Buffalo*, } *Com.*
JOHN A. KING, *Great Neck*, }

REPORT

ON THE IMPLEMENTS AND MACHINES ON EXHIBITION AT THE 32D ANNUAL FAIR OF THE NEW YORK STATE AGRICULTURAL SOCIETY AT ELMIRA, SEPTEMBER 30, AND OCTOBER 1, 2, 3, 4, 1872, BY X. A. WILLARD, OF LITTLE FALLS, N. Y.

The Fairs of the New York State Agricultural Society have been distinguished for the extent and excellence of the display in the department of machinery and farm implements. At the late Elmira Exhibition, this department was well represented, and although it may have been surpassed by some former shows in variety of novelties, the quality of work shown, it is believed, has never been excelled.

There is no department of our Fairs that exhibits progress more plainly than that relating to mechanical invention. The march of invention is truly wonderful; crude ideas, objectionable features in machinery and implements are constantly giving way to other forms and devices more perfect and useful. That steady progress is overcoming defects, becomes plainly apparent to him who gives only a moderate share of attention to the various machines at the State Fairs from year to year. And it is this progress constantly going on, this effort on the part of inventors to make iron and wood and steel better subserve the place of living muscle, in lessening human labour, that renders the show of implements and machinery at our Fairs of inestimable value. How many farmers and mechanics have had heavy burthens of toil removed from their lives by first becoming acquainted with labour-saving implements at our State Fairs we may never know, but the number we believe is legion.

In making a report upon the Implement department of the Fair, we must necessarily be brief, but we shall hope to give a clear and impartial record of all articles of merit coming under our observation.

PLOUGHS.

The show of ploughs was large and excellent, and first in point of merit as exhibitors, was the AMES PLOW COMPANY, Boston, which had 22 ploughs of various patterns, steel and iron, upon the ground. This company claims that its list of ploughs embraces sizes and forms adapted to every kind of soil and to the peculiarities of a widely varied agriculture. The improved Deep Tillers are constructed by a scale of proportions invented by Samuel A. Knox, well known for his inventions connected with this implement. His mode of construction admits of all the variations necessary to produce long or short mould-boards, with straight, concave or convex lines, as required for different soils or kinds of work. Thus it is claimed "the mould-boards so constructed have such a combination as presents an equal bearing against the furrow slice, and insures an even polish to the entire face of the mould-board, while the furrow slice undergoes an equal and effectual twist which lays it down with precision, disintegrating and pulverising the soil, and leaving it well fitted for the reception of atmospheric influence and free expansion of the roots of vegetation." The ploughs seem to be well made, and to have the various fittings attached which ensure strength and the requisite variations in depth and width of furrows. Those of iron are so formed as to combine lightness with strength. "The edges of the points and soles of the land sides and mould-boards are hardened in casting by a process of chilling, which ensures more than ordinary wear. Those of steel are of the best cast steel, and have a smooth polish. The wood parts are of white oak, dressed out by certain guides and patterns, so that all the ploughs of a given kind are alike in their parts and uniform in operation." Each of the parts of any particular plough has a specific mark inscribed upon it by which it is distinguished from those of other ploughs—a convenience which will be readily seen in replacing ordinary parts which may happen to get broken or worn.

The hard steel ploughs of this company are made under a process which ensures not only hardness but toughness of metal. These qualities are secured, they claim, by their metal having had about one-third on each side converted into steel without changing the centre. This allows each piece to be hardened very hard while the centre remains flexible. In testing the sides of the mould-board with a file we found that it made little or no impression, being apparently harder than the file.

The style of ploughs called the Telegraph for greensward is new, and is an improvement in the form of mould-boards, and in securing the beam by a clasp instead of a bolt.

The hard steel *Swivel plough*, shown by the Ames Company, appeared to us to be very meritorious—light, easily handled, and convenient in its adjustment. The Ames Company, on account of the great variety of ploughs shown, their perfection in form and finish, are entitled to great credit. Their display was the best for a single firm that we have ever seen on our Fair grounds.

BARAGER & JENNINGS, of Candor, N. Y., showed a reversible plough, the peculiarity of which consists in the upper section of the mould-board swinging round with the beam instead of being changed from one side of the standard and beam to the other, as is usual, at each turning of the team. In this arrangement there are two points, one forward and one back, to which the

mould-board adjusts itself as the beam is swung round. This device was patented in 1871. The advantages claimed for this plough are, that it needs no lifting by the ploughman; it takes no labour of the ploughman to reverse it, being wholly reversed by the team, and is therefore in working place as soon as the team; of light draught, and easy to hold on account of its peculiar construction. It is claimed also to be durable and to do good work. Price $20.

Stringer, Burr & Co., of Munsville, N. Y., exhibited nine ploughs, six of which were steel and one reversible plough with iron beam. We do not find the name of this firm on the catalogue, and suppose the ploughs were on exhibition only.

H. W. Camp, Oswego, N. Y., had seven ploughs on the grounds. swivel, side hill, hilling, and for ordinary work. The form of this last is long on the land side, with mould-board chilled on the edge and wheel directly under the beam to give it a steady motion. The hilling plough has a movable centre piece for regulating the quantity of dirt—extra wings for wider rows. The movable shoes are easily replaced, and the implement appeared capable of doing good work. Price $8.50.

The *Blind Ditching Plough*, exhibited by George Chamberlain and Son, Olean, N. Y., is simply a point or shoe attached to a wide standard. This point is so constructed as to press the earth back by being made wedging, leaving the ditch or hole after it. The ditch is made as fast as the team can travel over the ground by drawing the point of the plough from twelve to eighteen inches under the ground. If anything drops behind the point, there is a ball that presses it back again and smooths the hole. The operation of this machine is intended as a substitute for draining with tile, the inventor claiming he can make a ditch every four feet apart, at a cost of one dollar per acre with the plough, while to lay tile would cost from $20 to $50 per acre. He claims that the hole made by the plough will remain from two to five years on clay lands to which it is adapted. Price $20 to $25.

Hodge's Patent Reversible Plough, by Ford and Brothers, Oneonta, N Y. This is an iron beam with convex mould-board. The principle on which it is constructed is claimed to be new, and the points wherein it differs from others are described by the inventor as follows:

1st. The rear pivot, on which the mould-board turns, is raised from the ground, whereas all others pivot as low as possible. By this simple arrangement the mould-board is set at any desired angle, and as much turn put in it as may be required for any kind of ploughing. This also makes the plough higher than it is wide, by as much as the pivot is raised from the ground, so that a lap furrow can be turned.

2d. The land-sides are bolted together, forming the shoe, and presenting a smooth surface to the land on either side.

3d. A spring catch or latch takes the place of the old style hook. This is so arranged that it is released by the foot, and catches of itself when the plough is reversed.

4th. The coulter is so made that the ploughman moves it from one side of the beam to the other when reversing the plough. The yoke is pivoted to the beam, giving the coulter a chance to clear itself in stony land. When thrown up, its centre of gravity is toward the rear of the plough, and when not wanted, the ploughman only has to throw it back to have it out of the way.

Price from $6 to $15, according to size.

Concave-Convex Plough, of the Higganum Manufacturing Company, Higganum, Conn. In this plough it is claimed the peculiar shape of the mould-board prevents clogging and sticking of the earth to the mould-board, especially in wet soils. That it has a very light draught, and from its short beam it runs very steady and will catch quick in stony ground, and that it leaves the soil in excellent condition. The plough is provided with a patent saw tooth coulter for cutting roots and frozen earth, the teeth of which are so constructed that they are sharpened by its wear, and are always in good cutting order. Weight of plough 90 pounds. Cost $20.

Hodge's Adjustable Land-Side Plough, E. C. Hodge, Oneonta, N. Y. This is of cast iron—iron beam, and has a convex mould-board. It is adjustable from 17 inches to 20 inches, by moving rods that hold the plough together. These rods move in slots up or down in the handles of the plough. The advantage claimed is that in ploughing sod or stubble it can be adjusted in different kinds of land to suit. It has a folding coulter hung on a bolt, and that may be swung up in the beam where it is held by a spring. Weight of plough 185 pounds. Price $20.

The Holbrook Ploughs, F. F. Holbrook & Co., Boston, Mass. This firm had eight ploughs on exhibition, embracing their one and two-horse swivel ploughs, their bog meadow and national prize plough with wheel and cutter. We need hardly refer to these ploughs which have become noted for their work in the implement trial at Utica, and have been very fully described in the Transactions of the State Society. The Holbrook ploughs are distinguished for their good workmanship, being strong and durable, and all parts readily replaced in case of breakage. The one-horse swivel plough, with new clevis for horse to go in furrow and to plough close to small fruit trees, etc., turning a furrow either way, merits attention. Price with extras $15. Two-horse swivel plough, with wheel and cutter, $22. Bog meadow, with wide steel share and double clevis, $40. One-horse garden plough, $9. National plough, $18. Three-horse $25.

Harrows.

In harrows the entries were light, but two or three novelties were noticed.

Albert Kane, of Newport, N. Y., showed a *Portable Harrow*, which consisted of two wings of wood set with teeth in the usual manner, but provided with folding iron runners. In moving from the field or from place to place, the wings are brought together by simply turning one upon the other, while at the same time the iron runners are opened out and the harrow is converted into a sled, ready to be moved wherever desired. This arrangement is very neat and convenient, and will commend itself to farmers. Price $25.

S. W. Hall, of Elmira, N. Y., had what he called a *Smoothing Harrow and Mulcher*. In this implement the teeth are set slanting in the frame on the same principle as Thomas' smoothing harrow, while there are three pieces of plank also set slanting which follow, and are hung under the drag. Persons present who had used this form of implement spoke of its doing good work. Price $12.

C. C. Bradley & Son, of Syracuse, N. Y. A Scotch harrow with solid steel teeth. The form of this is well known and need not be described. Price $20.

Grain Drills.

Grain drills are now constructed so as to do their work in a very superior manner. The advantage in

drill-sowing grain over broad-cast sowing, is very generally recognized. A good drill distributes the seed evenly and regularly at a sufficient and uniform depth to ensure moisture and thereby all germinate at once. In broad-cast sowing a part of the seed is left uncovered, and that which is covered by the harrow is at unequal depths, and thus the seed exposed to birds, to drying winds and scorching suns. and much of it fails to germinate, or does not mature into strong healthy plants.

The show of drills was excellent. Bickford & Huffman, of Macedon, N. Y., exhibited their *Farmers' Favorite* in two styles, the one for sowing grains only, and the other with full attachments combined for sowing field grains, grass seeds and fertilizers. Hon. J. Stanton Gould, in speaking of this drill, says:

"I have never, in a pretty extensive acquaintance with seed machines, found any which *for durability, accuracy, facility of management and repair, economy and adaptation to all the variety of circumstances which are met with in the field* will compare with it in excellence. You will observe that the peculiarities of this drill which, in my judgment render it superior to any other, are, that it forces the seed forward, independent of gravity, by the continuous action of the distributing wheel without injury to the grain, and with such exactness that when you have determined the quantity you will sow per acre, and adjusted the lever to the corresponding point of the index, *you will find, as I have often personally proved*, that when the grain is all emptied from the reservoir, you have sown or measured an acre of ground *nearly as accurately as a surveyor could do it*. Another striking peculiarity of this drill is the double-flanged distributing wheel and corresponding double shell guards, which, without increasing its size or weight, converts the implement into two drills of entirely different capacities, each admirably performing its work, one sowing the coarse grains perfectly, the other equally effective in planting wheat and rye. With very ample facilities for judging, I am quite sure there is no machine before the public which will answer all purposes of the farmer so well as the 'Farmers' Favorite.'"

Price according to size, etc., from $80 to $125.

The Bristol Iron Works, Owego, N. Y, also showed two drills, viz.: The *nine tube Champion Grain Drill*, with fertilizer, broad-cast and grass seed attachments, 6 feet 6 inches wide, $120, and the *eleven tube Champion Grain Drill*, with broad-cast and grass seed attachments, 8 feet wide, $118. The manufacturers describe their machine as follows: "The distributor is made entirely of iron, and time or use cannot make any difference with the feed. It is a force feed and perfect distributor of coarse grain, such as corn, beans, peas, etc., as well as of finer grains. It has no flanges on the inside to cut off or divide the stream, and consequently gives an even and continuous flow, and will not crack or injure the seed. The even and continuous delivery of grain is regulated to its required quantity by a simple change of gear. The grain box has an inclined bottom with a perpendicular end which renders it impossible for the grain to clog in passing from the hopper to the distributor. The distributor cannot clog for the reason that the passage for the grain is of uniform size throughout. It is easily operated from the front of the box, or from the rear of the machine, at the option of the workman. The tubes are made from two patterns, and can be worked in a straight line or zigzag, as the case may require. The zigzag tubes are constructed in such a manner as to have a clear passage of one foot between every two tubes, allowing obstructions (such as stones, sod, stubble and top dressing) not above one foot across to pass freely between the hoes without lifting them, thus rendering the operation of the machinery easy to the operator while seated on the box, as it is seldom necessary to raise the tubes except when turning round. Its self-operating cut-off which renders it impossible for the operator to make a mistake in letting on or shutting off his feed." The machine is strong and well built.

The Empire Grain Drill, manufactured by H L. & C. P. Brown, of Shortsville, N. Y. This machine is so constructed that the grass seeder deposits the seed principally between the rows of grain. The discharge is in plain view, and the cut-off on either side by means of valve operated on outside. The conductors are of sheet iron. Price of different sizes, from 8 to 12 tubes. $70 to $90, and fertilizer attachment. $20 extra. Flax seed sower and grass seed, $7 additional.

The Buckeye Grain Drill, shown by P. P. Mast & Co, Springfield, Ohio, has been some time before the public, and is well known to grain growers of the West. It sows all kinds of grain, and has attachment for distributing fertilizers, plaster, etc. The drill has feeders inclosed in iron cups beneath the hopper, and the quantity sown is regulated by the speed of the feeders, and can be varied from three pecks of wheat to three bushels of oats. This is accomplished by a series of cog wheels of the proper size to produce the exact number of revolutions required for the quantity of seed desired. The grass seed sower is placed behind the grain hopper, and spreads the grass seed broadcast behind the tubes. The drill has high wheels and long tubes, each drill is provided with a land measure, which measures and registers the acres as the seeding progresses. The hoes can be changed from straight to zigzag, and the reverse by the operator in an instant, and without stopping the team. The drill is well balanced, and bears lightly on the horses' necks, and this is accomplished by placing the hopper back on the axles a sufficient distance to balance the weight in front. Price $90.

Seed Sowers, Etc.

Harrington's Patent Combined Seed Sower and Cultivator was shown by the Ames Plow Company, Boston, Mass. This machine sows all kinds of seeds, and is so arranged that by removing the hopper and its accompanying parts from the frame and substituting the cultivator attachment, the sower is quickly changed to a cultivator. Very convenient. Price $15.

Novelty Corn Planter, by Geo. W. Heath, Burlington, Penn. This machine has a wheel in front, is provided with a marker for marking the ground, and the seed is dropped by operating a hand lever. The inventor claims that with this machine the ground can be correctly marked both ways, and fifty hills of corn or beans dropped and covered per minute. Price $20.

The Tompkins County Broadcast Plaster and Seed Sower, by the Ithaca Agricultural Works, Ithaca. N. Y., was shown, together with other devices, in this class of machines. They are all useful, but are so well known that further reference to them is not necessary.

Horse Hoes, Cultivators, Etc.

French's Patent Cultivator, by the Ames Plow Company, Boston, Mass. This is a light horse cultivator, and the improvement is chiefly in the teeth, which are one inch square, curved forward, pointed, and about ten inches long. They are set cornerwise in an adjustable frame which is made so as to shut up to a foot or

expand to nearly three feet. It is light, easy to handle, and is specially designed for market gardens and field culture of roots and strawberries. We saw this implement first in operation at the farm of the Maine State Agricultural College, where it did good work. Price $12.

The *Boston Horse Hoe*, by the AMES PLOW COMPANY, Boston, Mass., has a strong light iron frame and three improved ploughs or moulds that throw the earth to and from the plants. It can be gauged by the wheel to work any depth from three to seven inches. The machine, it is claimed, will work well on hard, compact, rough or stony land, and is very effective in destroying twitch grass.

The Knox Patent Horse Hoe, also shown by the AMES PLOW COMPANY, has been a long time before the public, and has been very generally commended. Price of either of the above, $12

The *Cast Iron Cultivator*, shown by H. W. CAMP, Owego, N. Y., is provided with wings to be used after cultivating for hilling. It can be widened from 15 to 36 inches. Price $13.

The *Tompkins County Cultivator* (one horse), shown by the ITHACA AGRICULTURAL WORKS, Ithaca, N. Y., is noticeable in having a lever for raising the guide wheel. Price $10.

POTATO PLANTERS.

Where considerable quantities of land are annually devoted to potatoes, it undoubtedly pays well to do the planting by machinery. If the land is well prepared and free from obstructions, machines are now made that will do the work in a good manner and so expeditiously that a great saving is made in time and labour. The importance of finishing the planting, as soon as may be after the ground is ready, can scarcely be overestimated, especially with those sorts intended for early marketing. We have known in many instances the larger part of the crop so delayed in planting by bad weather, as not to be in time for the early markets, and hence losses ensued which would not have occurred had machinery been relied on for planting instead of hand labour. It has been urged as an objection to machines, which cut, as well as plant, the potatoes, that much of the seed is liable to be injured in the cutting. Doubtless some pieces will be left "without eyes" or in a less perfect condition for seed than when cut carefully by hand. Still we think this objection practically is of not so much account as many suppose. The cost of planting by hand has been variously estimated at from $3 to $4 per acre, thus, marking ground both ways 75 cents; cutting seed 75 cents; dropping seed $1.00, covering seed $1.50, making a total of $4.00. Now, a machine that will plant 6 acres per day, the cost may be put as follows: Team and driver, $4.00; boy to attend delivery, 75 cents; total, $4.75, or say about seventy-five cents per acre.

We noticed but two machines at the fair. The one exhibited by S W. HALL, of Elmira, N. Y., was a potato planter, cultivator, and roller combined. In this machine, when the cutting apparatus was removed, it was arranged so as to be readily converted into a cultivator. The machine after cutting the seed left it in a box from which a boy distributed the requisite number of pieces to the hopper for planting. This machine was rather roughly made, but was said to work well. The inventor will doubtless make some improvements in its construction. Price $45.

Kent's Patent Potato Planter, H. J. KENT, Palmyra, N. Y. This appeared to be a good machine, simple, durable, and not liable to get out of order. It cuts the seed in three pieces, which drop in a spout and are covered by two ploughs which follow behind. It plants either in hills or drills at the rate of 6 to 8 acres per day. Price of planter with cutter, $75.

MOWERS AND REAPERS.

The exhibition in mowers and reapers was very extensive, and considering the perfection which now obtains in this class of machines, it was the best show we have ever seen at the State Fair. One noticeable feature, in looking over this splendid display, was the excellent workmanship and finished appearance of all the various machines. No pains seemed to be spared to provide the best material, and to have all parts made substantial and durable. Manufacturers have learned that they cannot afford to let a poor machine go out from their shops. The competition for public favour is so strong that no machine, liable to get out of order, to break in ordinary usage, or that cannot do first-class work, can meet with any considerable sale, and its manufacturers would soon be ruined financially in their efforts to make and introduce such a machine for general use. We have no doubt that every machine exhibited at the Fair would, under ordinary circumstances, do first-class work. Some are more conveniently handled than others, and some are doubtless better adapted to operate in lodged grass or grain, or upon rough and stony lands. Some are more durable than others, and are repaired with more ease and with less expense. Some are of lighter draft than others. It is upon such points as these that the different manufacturers claim superiority, and not that a competitor is unable to do good work when all the circumstances are favourable. It is not our purpose to give a description of the different machines on exhibition. Most of these have been fully described in the Reports of the Society, from time to time, but it may be well to give a list of those on the ground as a matter of record of the Fair. We name those marked in our note book as coming under our observation.

ADRIANCE, PLATT & CO., Poughkeepsie, N. Y., had four machines on the grounds. *Buckeye New Model Mower*, 4 feet cut, 585 pounds, price $100 No. 2, 4 feet 1 inch cut, 600 pounds, $100. *Buckeye Harvester*, combined mower and self-raking reaper, 4 feet 5 inch cut as mower, 5¼ feet cut as reaper. Price $200.

CAYUGA CHIEF MANUFACTURING COMPANY, Auburn, N. Y., four machines. *Cayuga Chief Mower*, No. 2. 4 feet 6 inch cut, 700 pounds, $125. No. 3, 4 feet 2 inch cut, 600 pounds, $110. *Combined Self-Raking Reaper and Mower*, 4 feet 6 inch cut as mower, 5 feet cut as reaper, 1,000 pounds. $190, 6 feet cut as reaper, 1,050 pounds, $215. (Some improvements have been made during the past year in connection with the cutting apparatus).

CLIPPER MOWER AND REAPER COMPANY, New York, three machines. No. 4 mower, 750 pounds, 4 feet 6 inch cut, $130; No. 4 combined, 1,000 pounds, 4 feet 6 inch cut as mower, 5 feet 6 inch cut as reaper, $175; No. 2 new clipper, 600 pounds, 4 feet cut, $100.

DODGE AND STEVENSON MANUFACTURING COMPANY, Auburn, N. Y. Two machines, combined mower and self-raking reaper, two sizes, No. 1, 5 feet 6 inch cut, 1,200 pounds, $210. No. 2, 4 feet 9 inch cut, 1,100 pounds, $190.

H. J. HERRINGTON, Valley Falls, N. Y, *Young Eagle Mower*, 4 feet cut, 635 pounds, $100.

THE JOHNSTON HARVESTER COMPANY, Brockport, N. Y., three machines. Self-raking reaper and mower

combined, 4 feet 5 inch cut, 1,030 pounds, $185. (This is a new machine brought out this past year, constructed of wrought iron; drive wheels 3 feet high, changeable speed.) Mower 4 feet cut, 545 pounds, $100.

D. M. OSBORNE & Co., Auburn. N. Y., four machines. One mower, one reaper, and two combined. Two-wheeled mower, 4 feet 2 inch cut, 625 pounds, $100; self-raking reaper, 5 feet 6 inch cut, 1,050 pounds, $150; combined mower and reaper, 5 feet cut, 1,060 pounds, $175; as self-raking reaper, 1,100 pounds, $180.

CHARLES PERRIGO & Co., Groton, N. Y., *Young Warrior Mower*, 600 pounds, $100.

ISAAC RAWSON, Almond, N. Y., *Rawson's combined Mower and Reaper and Dropper*, 5 feet 6 inch cut, 800 pounds. $180; cut as mower, 4 feet 8 inches, $125. (Brought out this year—Planet gearing, castor wheel, and under draught.)

SEYMOUR, MORGAN & ALLEN, Brockport, N.Y., reaper and mower.

CRAWFORD & REMINGTON, Ilion, N. Y., *Sherwood Mower*, $100.

GEORGE W. RELYEA, Millport, N. Y., new attachment for the cutter of a mower, by which the knives are made to oscillate separately between the guards, $20. (We should have been glad to have seen this in practical operation. Its utility seemed to us to be questionable.)

RICHARDSON MANUFACTURING COMPANY, New York, *New Model Union Mowing Machine*, 510 pounds, $90.

ROCHESTER AGRICULTURAL WORKS, Rochester, N.Y., *Meadow Lark Mower*, iron frame, 542 pounds, 4 feet cut, $85; also *Hubbard Pony Mower*, 4 feet cut, $115; also *Hubbard Pony Self-raking Reaper*, 5 feet cut, $155; and *Hubbard Self-raking Reaper*, 5 feet 6 inch cut, $170; and *Meadow Lark Self-raking Reaper*, iron frame, 5 feet 6 inch cut, $125.

SMITH & DIXON, Port Byron, N. Y., set of stamped plate steel knife guards for harvesting machines, 50 cents. (These are made in skeleton form, and it is claimed they give a better cutting edge and have advantages in lightness and durability over old form.)

SPRAGUE MOWING MACHINE COMPANY, Providence, R. I., by Grant and DeWater, Elmira, agents, two-horse mower, 4 feet cut, 515 pounds, $100.

WALTER A. WOOD MOWING AND REAPING MACHINE COMPANY, Hoosick Falls, N. Y., *Wood's Self-rake Reaper*, 5 feet 6 inch cut; mowing attachment complete, 4 feet cut.

WARDER, MITCHELL & COMPANY, Springfield, O., self-rake combined reaper and mower, 1,200 pounds, $200; self-rake combined mower and reaper, 1,050 pounds, $190; single mower, 550 pounds, $100. These machines have wrought iron frames.

WILBER'S EUREKA MOWER AND REAPER MANUFACTURING COMPANY, Poughkeepsie, N.Y., *Wilber's Eureka Mower*, 750 pounds, 5 feet cut, $125; also same 800 pounds, 6 feet cut, $150.

THE WILLIAMS MOWER AND REAPER COMPANY, Syracuse, N. Y., the *Williams Combined Mower and Reaper*, 1,100 pounds, 4 feet 6 inch cut as mower, and 5 feet cut as reaper, $200; also, by same Company, *Williams Single Mower*, 650 pounds, 4 feet cut, $110.

HAY TEDDERS.

In this class of implements some new inventions have been brought out during the year.

Frink's Patent Flexible Tedder is a late invention, and was shown by the inventor, C. R. FRINK, Norwich, N. Y. This machine is so constructed that the axle constitutes the whole frame, and from the axle there are three brackets fifteen inches in length, on which rest the shafts for driving the working parts of the machine. On the shaft are placed three triangular pieces with friction rollers at each point, and a rim so constructed that the rim, eye, fork rod, cross-head and brace, are made of one piece of malleable iron—the cross-heads at the ends are to receive the forks. The forks are coiled like a bell or watch spring, and there are ten inches for reaction. The driving wheels are four and one-half feet in diameter, with a gear three feet in diameter, the pinion is 3½ inches in diameter.

The advantages claimed for this machine, are simplicity in construction, durability and cheapness in price, it being afforded for $45.

New York Combined Hay Tedder and Rake. This is another new invention brought out by STUART PERRY, of Newport, N. Y. It is a rotary tedder, and the inventor claims, after most thorough tests the past summer in Herkimer county, that it "never winds itself up with grass or clover, however heavy, or in whatever state, if properly used. Teds the grass thoroughly, and does not leave it pressed down by the driving wheels running over it afterward. Teds wider and yet has driving wheels nearer together, thus allowing its teeth to follow the ground surface more closely than other rotary machines; has large driving wheels and is easily run by one horse; is well balanced, either with or without the rider, and does not gall the neck of the horse; has an iron frame which keeps its driving wheels and gearing always true—is not liable to breakage," etc. It is turned into a rake by simply reversing the tedding apparatus, whereby the teeth are made to operate as a rake.

A difficulty found in combined machines is, that something must be sacrificed for the one or other separate machine represented. That is, that an implement for a distinct purpose can be made more perfect in separate than in combined machines. Mr. Perry thinks that no good quality in the tedder has been sacrificed in this combination, while the ready change which can be made of the machine to a rake, will often be found of great practical value in the hay field. Price $80 to $90.

HIGGANUM MANUFACTURING COMPANY, Higganum, Conn. A one-horse hay spreader. This machine has been improved and perfected during the season of 1872. The double cranks revolve in opposite directions. The forks are attached to wooden handles moving through sleeves on the lower crank. It has an iron frame, and the action of the fork is similar to that of hand spreading. Two machines were shown, No. 1, 400 pounds, $58, and No. 2, 500 pounds, $60.

Bullard Hay Tedder. This well known machine was shown by WM. H. FIELD, Port Chester, N. Y., price $75. This machine, since its first introduction, has been very greatly improved. Shown also by RICHARDSON MANUFACTURING COMPANY, New York, Nash & Brothers, agents, 500 pounds, 10 by 6 feet, $75.

The American Hay Tedder, AMES PLOW COMPANY, Boston, Mass., 630 pounds, price $80. This machine also is well known, and a favourite in some localities.

HORSE RAKES.

There has been some improvement in horse rakes during the past few years, and many of these implements are now made so as to be operated with remarkable facility and ease. There was an excellent exhibition of rakes at the Fair. Among the new patents, the *Empire State Horse Rake*, by LYND & TOUSLEY, Albion, N. Y., merits attention. This is a sulky rake,

and the head consists of a square bar of steel running in line of the centre of the wheel. The tooth sockets are square, and strung loose upon the head giving an independent action to each tooth, thus adapting itself to the uneven surface of the ground. It retains the teeth in an elevated position when the load is discharged by the pressure of the foot upon the same lever which throws the rake into gear. It operates from both wheels, thereby avoiding side draft. As the axle does not revolve, it permits the shafts to be firmly bolted and braced to the machine. No hand lever is used, and the operator needs only to use his hands in managing his horse. Another noticeable point is a foot lever which remains motionless during the general operation of the rake, but may be used either to hold the teeth firmly to their work or in an elevated position. Manufactured by the CURTIS MANUFACTURING COMPANY, Albion. Price $40; weight, 300 pounds.

The Tompkins County Wheel Rake, by the ITHACA AGRICULTURAL WORKS, Ithaca, N.Y. This rake has been improved during the year, the improvement consisting in a peculiar shaped hinge for connecting the shafts to the axletree, doing away with friction at that point, and applying the draft of the horse to discharge the rake, making it nearly self-operating. The teeth are of oil tempered steel, and each works independently on an oscillating axle. $40.

Sweet's Self-dumping Wheel Rake, by SWEET & FAULKNER, Dansville, N. Y. This rake was patented in 1871. It is unloaded by drawing down a brake on the tire of each wheel, by a small crank on each end of a rod running across on top of the axle. A very light pressure on a lever attached to this rod brings down the brakes on a wrought iron standard that is firmly bolted to the axle. The teeth being also fastened to the axle are of course lifted by a forward movement of the wheels. When the teeth are lifted sufficiently to unload the rake, the brakes are let off the wheels, and the teeth fall back into position for raking, where they are firmly held by a simple lock-lever, which is lengthened or shortened, to set the teeth high or low, by a thumb screw. A simple device is attached to the lock-lever which can in a instant be adjusted to prevent locking of the lever, which leaves the teeth entirely free to raise over uneven ground.

Coats' Lock-lever Hay and Grain Rake. COATS, GRAY & Co., New York, by Nash & Brothers, agents. This rake is easy to dump. It has a cleaner which works over the teeth to keep them free from hay in dumping. 200 pounds, $40.

M. C. Remington's Rake, Weedsport, N. Y., adjustable head so as to be raised three inches by loosening three bolts, one at each end and one in centre, in order to adapt it to different kinds of raking. In heavy hay the head is let low down. The steel teeth have each an independent action. There is a lateral brace to hold the teeth firmly in position. 290 pounds, $45.

Taylor's Patent Steel-Tooth Sulky Rake, B. C. TAYLOR MANUFACTURING COMPANY, Dayton, O. Two rakes shown. This rake has been several years known in the West. The teeth are of cast steel, oval in shape, which gives more strength than round teeth of the same weight. Each tooth is perfectly independent, and is held firmly by a patent bracket from vibrating, and can be taken out and put in in a few minutes. A spiral spring over each tooth gives it a compound spring, allowing it to raise or lower to accommodate itself to uneven ground. Each spring is supported by a patent standard, with stop to protect it. The tooth frame may be raised or lowered by a single bolt, any required distance from the ground, so as to rake clean without raising dust. 250 pounds, $45.

Wisner's Self-operating Horse Hay Rake, J. E. WISNER, Friendship, N. Y. The self-operating is by means of clutches connecting the wheels. By a light touch of a lever the clutches sliding on each axle arm engage with both wheels, which raise the teeth until they have cleared the hay, when the clutches are instantly disengaged and the teeth are at work again. The rake dumps perfectly while turning either way—apparently a good rake. 250 pounds, $40.

Burt's Self-adjusting Horse Rake, AMES PLOW COMPANY, Boston, Mass. This rake is well known and needs no description. 277 pounds, $42.50.

The Hallingsworth Rake, manufactured by JOHN DODDS & Co., Dayton, Ohio, and some others were on exhibition, but they are so well known that further reference to these implements may be passed over.

HAY LOADING MACHINES—HAY FORKS, ETC.

T. H. ARNOLD, Troy, Penn., *Hay Elevator and Carrier*. This is a simple device, consisting of a slide for conveying back the hay—a pivoted catch confines the carriage to end of track while hay is being elevated, also prevents the fork from descending at any point in the track, except at the front end, or over the load of hay when it returns—operates well. Price $10.

Hinman's Patent Railway Hay Conveyor for unloading hay and grain in barns, to be used with horse fork. HOMER W. FITCH & COMPANY of Lithgow, N. Y. In using this conveyor in connection with the fork, the hay is taken up in a perpendicular direction, and carried back and dropped at will of the operator at different points in the barn as desired. The conveyor is a small car about two feet long and seven inches wide, which runs back and forth on a wooden track erected in the peak of the barn. A cross bolt is put through the track, over the load of hay, to which the car fastens itself, until the forkful passes up and reaches it, when the clinch ring upon the draft rope passes into the car and releases it from its hold; at the same instant the fork with its load is held suspended underneath, and both are drawn along together over the mow by the horses attached to the draft ropes. The man on the load trips the fork with the tripping line, then draws the car back to the cross bolt and the fork comes down for a new load. Worked nicely on the fair grounds. Price $20.

Chapman's Railway Pitching Apparatus. JOHN H. CHAPMAN, Utica, N. Y. This apparatus is made up of four distinct machines combined, viz.: The Raymond grappling fork, the Powell elevating car, attaching grapples and post pulley. The car is run on two rails of wood 4¾ inches apart, hung close in the peak of the barn, and is constructed with special reference to durability and perfection of working. It admits of elevating at any point over the mow, or drive-way, or on outside of building. The post-pulley is a simple device for diminishing the travel of the horse, and is thus described by Mr. Chapman. "It consists of a pulley with casting-off plate attached to the top of a post. The post is located half the distance from the starting point, which the horse must travel in conveying the forkful to the extreme place of discharge. The horse goes to and around it and returns, the pulley retaining the rope while the horse is coming back to the starting point. The operator on the load having discharged his fork begins to draw it back; this moves the pulley in the opposite direction, carrying the casting-off plate under the rope,

and releasing it at once. Thus it will be seen the horse travels but once over the ground, not having to back up or return empty. The post pulley is entirely self-operating, the driver does not guide the rope to the pulley nor throw it off, and it thus facilitates working in confined places, in enclosed yards, and on uneven grounds." Price $40.

T. H. Arnold, Troy, Penn., *Hay Fork*. This has three tines with sliding tine coming together at outside stationary tines. The sliding tine is used as a handle in fixing it in the hay. It is very light implement, readily discharged and handy in picking up scatterings. Price $10.

The Pennock Manufacturing Company, Kennet square, Pa., *Harris' Patent Double Harpoon Fork*, for handling all kinds of hay, straw and grain. This is an excellent fork, light, handy and efficient. Price $10.

Threshing Machines.

There was a fine display in this department, made by the well known firms, Wheeler, Melick & Co., Albany, N. Y.; Blood & Co., Athens, Penn.; G. Westinghouse & Co., Schenectady, N. Y., and Perrigo & Avery, Groton, N. Y. The machines manufactured by these companies are distinguished for their excellence, and are so well known to the public that they need not be described here. In justice to the exhibitors, and as a record of the exhibition, we catalogue the machines shown, as follows:

Wheeler, Melick & Co., Patent straw preserving rye thresher, $150. By the same firm, two-horse railway power with 30 inch cylinder, thresher and cleaner, both mounted, $250. Also by same firm, one four or six-horse mounted lever power with 34 inch cylinder, thresher and cleaner, connected with belt direct, $540.

G. Westinghouse & Co., Steam power threshing machine, $400. By same firm, mounted horse power and thresher, $610.

Blood & Co., Thresher and separator, 450 pounds, $65. Also improved thresher and cleaner, 800 pounds, $200.

Perrigo & Avery, Separator and thresher for threshing and cleaning grain. 2,000 pounds, $300.

M. Williams & Co., St. Johnsville, N. Y. Two-horse and three-horse machine. $240.

Animal Powers

Blood & Co., Athens Penn., had six powers on the grounds, viz.: One six-horse sweep, 800 pounds, $100. Two-horse railway, 1,750 pounds, $165. One single horse power, 1 050 pounds, $135. One single horse churn power, $110. Calf power for churning, 250 pounds, $37. Dog power for churning, 180 pounds, $22.

S W. Hall, Elmira, N. Y., showed what he calls a novelty horse power. In this machine the gearing is in the centre, about which there is a circular track for several large wheels which are connected by arms to the gearing and to which the horses are attached. Price $150.

An Endless Chain Dog Power, was exhibited by Geo. N. Palmer, Greene, N. Y., 250 pounds, $85.

The horse power of Chas. Perrigo & Co., of Groton, N. Y., weighs 2,000 pounds, and costs $140.

Reuben Stiles, East Troy, Pa. Potter's patent railroad powers. One horse, 1,200 pounds, $130. Calf power, 600 pounds, $75.

The two-horse power of M. Williams & Co., St. Johnsville, N. Y. 160 pounds, $165; three-horse, 2,100 pounds, $200. These completed the list in this department.

Potato Diggers.

Considerable ingenuity has been given of late years to devices for digging potatoes. Many of them have not proved practicable in the field on account of the imperfect manner of doing their work, leaving some of the tubers covered with dirt, and being liable to obstructions from vines, weeds, etc. There were two machines on the ground which the inventors claim have been so improved and perfected during the past year as to do good work.

The Knox Digger, shown by Sellew & Popple, of Dunkirk, N. Y. This machine is on wheels, the shaker in the centre swings behind the shovel. It is provided with claws for pulling the vines, and lever for regulating depth. It has a lever for throwing the machine out of gear, and can be raised by lever when at the end of a row in turning round. The manufacturers claim that this machine is practicable, durable and easily operated, that it will dig from five to seven acres per day, doing the work of twenty men. They say the machine operates successfully when potatoes are planted in hills, but they recommend drill planting. They claim also that no grass, weeds or tops will obstruct the machine. 450 pounds, $100.

Allis & Hotchkin had a potato digger on the ground which was patented in 1872. This machine is on wheels, and has two saws on the sides for keeping free of weeds and vines. It has a vibrating separator and shovel in the centre, and is provided with arms revolving with shaft to carry off vines, sods, etc. This is also claimed to be an efficient machine.

A. Q. Allis, Rochester, N. Y. *Carrier's Patent Potato Digger*, noted in the catalogue as having been entered, we did not see upon the grounds.

Stump Machines.

Some of these on exhibition have been shown at former fairs of the Society.

O. A. Anthony, Mayfield, N. Y., *Lifting Jack for Stump pulling and Stone lifting*. This is a simple and efficient machine. It has a leverage of 75 pounds to 1, is constructed with a double pawl on top, and double lever power attached to pawls, the shaft for lifting moving up from notch to notch as power is applied. The whole apparatus weighs but 125 pounds, and can be taken down and set up by one person. Price $35.

Chamberlain's Patent Double Threaded Vibrating Screw Stump Puller. George Chamberlain & Son, Olean, N. Y. In this machine the three timbers forming the legs are joined together at the top, at which point is introduced the screw with its accompanying attachments for lifting the stump. On the upper end of the screw, and above the point where the legs are joined together, is the nut to which is attached the descending lever. Here the horses are attached, and as the lever is drawn round outside the supports or legs, the screw rises upward, raising the stump fastened with a chain to the lower end of the screw. The advantage claimed for this machine is, that it is not liable to break or get out of repair. It is so simple that any one can work it, and will pull the stumps clear from the ground and leave the dirt in the hole where it is required. 1,600 to 2,400 pounds, $200.

Patent Stump Extractor, John Rowler, Webb's Mills, N. Y. This machine is similar to those which have been long in use. It has 4 standards, 2 for tipping, and the power consists of pulley, tackle and rope attachments, etc., 1,500 pounds, $80 to $185.

Hay and Cattle Scales.

These were represented by the Jones Scale Works, Binghamton, N. Y., noted for making one of the best at cheap rates. Four ton hay scale, 14 feet by 7 feet, $87.50.

H. B. Osgood, Binghamton, N. Y., also showed a four ton hay scale, $100.

Machines for Cleaning Grain, Etc.

James Bradner, Pine Creek, N. Y. Fanning mill which has an improved feeder in hopper, also an improved chess-board and hopper screen for taking out timothy seed. Also a similar machine with bagger attached. $30 to $40.

J. A. Krake, Alden, N. Y., Clipper separator for chaffing and cleaning all kinds of grain seed, 22 by 28 inches, self-cleaning hopper, etc. In this machine there is a double vibration to every revolution of fan shaft. Deflector for turning blast and forcing it up through the seive. Has an adjustable apron for direct blast, and for keeping off the screen in saving light grain. $30.

Corn Huskers.

There were two machines in operation on the grounds.

The National Corn Husker, by R. C. McNeil, of Campville, N. Y. This machine, it was claimed, has capacity for husking 60 bushels of corn per hour with ordinary two-horse tread power. The principal features of this machine are, a revolving apron or bridge passing over the husking rollers. These rollers are of iron, spiral grooved, running with a spur-gear, ten in number, and rolling in pairs in opposite directions. The corn upon the stalk is thrown upon the machine and passes to the front, where it goes through two rollers and the ear is cut off and drops on the husking rollers carried by the endless chain bridge to the rear of the machine. The husks which are twisted or rolled off by the rollers fall underneath, the stalks meanwhile having been passed out the front end of the machine. The machine was in operation during the Fair, it works rapidly, taking the husks off clean and without shelling the corn from the cob. We should say from what we saw of its operation that it is a valuable device, and must prove a favorite with extensive corn growers. 600 pounds, $150.

Philips Spiral Corn Husker, by Philips Corn Husker Company. Stockport, N. Y., was also in operation. This is a differently constructed machine than the other, and is briefly described by the inventor, as follows: "It consists of a frame about three feet long by two feet six inches wide, made of joist three by four inches. Across one end, near the top of the frame, are placed two picking rolls, provided with screw threads gearing into each other, between which the stalks are fed, and fall in front of the machine in good condition for binding, divested of every ear, great and small. The ears, as they are severed from the stalk, drop upon the husking rolls, which are placed lower down on the frame, at right angles to the picking rolls, and in an inclined position. Upon the surface of one or both of these rolls are spiral depressions or grooves, which answer the purpose of allowing spikes to be put upon the surface of the opposite roll corresponding with said depressions or grooves, and also allow the ear to settle down between the rolls, so that the grip upon the husk may be more certain. These depressions and spikes being arranged spirally upon the rolls, grip the husks at one end of the ear, and continue the grasp to the opposite end, making the process of stripping the husk from every ear very similar to husking by hand. As the ears slide down over the rolls, the husks caught by these steel spikes are torn off and drop under the machine, while the ears pass on to the end of the rolls, and are received into a basket—thus delivering the stalks in front, the husks beneath, and the corn in the rear of the machine; the latter at the rate of 300 to 500 bushels per day. The capacity can be increased to 1,000 bushels or more per day."

In the operation of this machine it did not appear to husk so fast as the one first described. It seemed to be well built, strong and durable. Price for husker, $105; husker and carrier, $125.

Portable Feed Mill, Etc.

Howland's Patent Improved Feed Mill for grinding or chopping feed. Thomas W. Hotchkiss. Elmira, N. Y. This mill has small chilled iron grinders about 6 inches in diameter, one stationary and one revolving against it. The grinders have a burr millstone cut. A two-horse power we are told was sufficient to grind with this mill 20 bushels of grain per hour. It was in operation and did good work 200 pounds, $100.

A Hand Feed or Chaff Cutter was shown by Pierpont & Stevens, New Haven, Conn.

Farm Grain Mill.

Joseph Sedgebeer of Painsville, Ohio, had in operation a diamond nonpareil grinding mill. This mill is self-sharpening, and is claimed to be very durable, some mills having run 8 years without changing plates. It will crush or grind corn in the ear green or dry at one operation, grinds all kinds of grain whether clean or mixed; grinders are of chilled iron with raised teeth. With 3 to 4 horse power, from 10 to 25 bushels are ground per hour.

Corn Shellers.

Legg's Patent Corn Sheller, by Caleb J. Legg, Penn Yan, N. Y., appeared to be a good thing where large quantities of corn are to be shelled and fitted for market. It has a vertical tooth cylinder, the teeth are set on a scroll which carries the corn upon a seive that shakes and separates the kernel from the cob, husks, etc. After receiving a blast from the fan, the grain runs down on an incline plane to the elevator, and is carried up and emptied into bags—thus preparing corn for market at one operation from the field. A 4 horse power, it was stated, would run this machine so as to shell 1,500 bushels in ten hours. 500 pounds, $80 to $500.

H. W. Cornell of Owego, N. Y. A hand corn sheller running with small amount of power, and shelling large and small ears without adjustment. 150 pounds, $20.

Portable Saw Mills.

These mills attracted considerable attention while in operation on the grounds.

H. & F. Blandy, Zanesville, Ohio, had their double circular saw mill on the ground, which was run by power furnished by their *portable engine*. The follow- account which they give of their invention will perhaps be of interest in this connection:

"There has been until within a few years past considerable prejudice against circular saw mills. Many people supposed that the muley and sash saws were much better adapted to sawing hard wood and that they made smoother lumber. These prejudices, however, have been generally dispelled, and it is now conceded that *the circular saw makes the smoothest lumber and is best adapted to sawing all kinds of*

timber. The strength of the machinery, and the accuracy of the set works in the Blandy portable saw mills, have done more to overcome these prejudices, and establish the superiority of circular saws, than all other causes put together. The perfection of the Blandy saw mill is the result of thirteen years' observation and experience in making and operating them. They have constantly consulted successful and experienced sawyers, and from time to time have added such improvements as seemed to be needed, and now challenge the world to furnish a better. Their mills are very firmly and compactly made, have great durability, and are capable of sawing all the lumber that any set of men can handle.

"They also provide their mills with either clutch or friction feed, at the option of purchasers. Their friction feed is regarded as the best and simplest friction feed ever constructed. Simple, effective and durable is their motto in the construction of all their machinery.

"There is nothing connected with saw mills that has excited more enquiry or elicited more inventive genius than head blocks. The best of lumber is reduced to third or fourth rate if sawed unevenly, and even, smooth lumber cannot be secured except by some setting apparatus that will set both ends of the log to exactly the same fraction of an inch. To insure this, the two head blocks must be so connected that the same application of power will set both ends of the log simultaneously. It frequently happens that when a log is first rolled upon the carriage one end is so much larger than the other it is desirable to have the knee of one head block in advance of the other, hence some plan is needed by which either end of the log may be set without moving the other end. This is also necessary in sawing fence posts and other wedged-shaped lumber. To meet this want, the new *Blandy Patent Head Blocks* are exactly the thing. These head blocks are always connected, and, at the same time, always disconnected. By a single motion, both ends of the log can be set at the same time, or either one separately, just as the operator desires. Or, one end may be set for one thickness of lumber, and the other end for another thickness. This is done instantly and with perfect accuracy, without throwing anything in or out of gear, and without lifting out or in any pawls. The setter can set either or both ends without leaving his position, or the sawyer can do the setting himself, and thereby save the expense of one man. These head blocks have been thoroughly tested. Two hundred and fifty of them are now in use and they are giving universal satisfaction. We have secured the exclusive right to them by letters patent.

"The carriage that carries the log to the saw is mounted upon six-inch iron wheels connected by iron axles running in Babbited bearings, with the wheels next to the saw grooving, and running on a V shaped rail, thereby securing great strength, durability and accuracy, and requiring but little power to move the carriage. The pinions and racks are made very strong, and so constructed as to protect them from the usual accidents that occur to such machinery.

"This mill, when driven by a Blandy engine, 20 to 80 horse power, either portable or stationary, will saw from 6,000 to 15,000 feet of lumber per day."

The *Elmira Advertiser*, in its notice of the Fair, has the following:

"A Portable Circular Saw Mill, exhibited by H. & F. Blandy, Zanesville, Ohio, deserves more of a notice than we have yet extended to it. It took the first premium yesterday. It is an automatic marvel, having all the contrivances necessary to make it complete, and withal very simple. It will do about any kind of sawing, and three men can run it. There are some new principles applied to the engine which furnishes it with power, and to the running gear, that entitle it to especial notice. It was the continual centre of a very large crowd yesterday." Price $950.

Cider Mills.

There was quite a large exhibition in cider mills and machinery.

The National Family Cider Mill, shown by the Ames Plow Company, and which took first premium, is a small, neat and handy mill for family use. The grinding arrangement is very simple, consisting of two rollers arranged to work together in such manner that the cells of the fruit are broken and a very fine pomace produced. It has a strong compact frame with two curbs requiring no handling of the pomace after crushing. Price $25.

Butterworth's Portable Cider Press, R. Butterworth, Trenton, N. J. This is provided with two stationary wrought iron screws (one right and one left hand thread) which are rigidly fastened to the bottom of the press, and are also made to serve as guides to the follower as it is forced down by the ratchet nuts which revolve upon the screws. The ratchet nuts are secured in the follower, and in operation move it up or down, according to the direction in which they are turned. 1,000 pounds, 5 by 4 feet, $100.

The Butterworth Apple Grinder has an iron cylinder into which are inserted steel grater knives. The knives are adjusted and secured in their places by means of steel set screws, and when they need sharpening or renewing can be taken out and reset. It has a sectional iron concave held in position by independent steel springs which are adjustable to any desired pressure. The whole arrangement is so combined that the mill cannot be injured by stones. 200 pounds, $75.

The Buckeye Cider Mill, by P. P. Mast & Co., Springfield, Ohio. This mill crushes the apples instead of grating them. It has three cast-iron cylinders with straight fluted ribs, the first or upper cylinder crushes the apples into coarse pomace, and then feeds it through the lower cylinders, which crush it into fine pomace. It has an adjustable throat piece by which the mill is regulated for large or small apples. It is all embraced in a single frame 2¼ by 3 feet, and has a two-inch wrought iron screw for pressing. Price $45.

Mount's New Power Press. J. W. Mount, Medina, N. Y. In this press there are two screws so arranged that they may be worked by wheels and a system of gearing. 1,000 pounds, 10 x 10 feet, $160.

Mr. Mount had quite a number of machines catalogued, but we do not find them on our notes, and therefore cannot say whether the machines were all on the ground or that we failed to take notes of them on account of exhibitor not being present when we made our tour of inspection.

Schenck's Apple Grinder, and the Broomer and Boschert Press, by Alexander, Bradley & Dunning, of Syracuse, N. Y. This press has immense power, is simple, compact, and is easily worked by one man, and it deservedly took first premium. The device is a combination of the screw, the lever, and the knuckle joint. The screw being self-adjusting, right and left hand playing between the arms of the knuckle joint drawing them to a perpendicular and accumulating power, which must be very great as the pomace becomes dense. One man was operating it upon the grounds,

and a large cheese of pomace was pressed very efficiently and with little labor to the operator. 2,000 pounds, 8 x 8 feet. Price $145.

Wests American Tire Setter.

J. B. West, Geneseo, N. Y. This is a valuable machine, and consists of wide bands of steel arranged in a circle for receiving the wheel. A screw attached to one end of the band and arranged so as to press against the other is used for contracting the circle, thus contracting and upsetting the tire on the wheel. The wheel being placed within the circular bands, the screw is moved by hand until the bands press up snugly against the tire. A lever with rachet is then used for turning the screw, and an immense contracting power is thus obtained. In this machine the inventor claims to have accomplished a result of great practical importance, that of upsetting a tire and making it sufficiently tight while on the wheel, without the aid of heat. Other machines have been invented for upsetting tires, but, unlike this, they require the tire to be removed from the wheel. The old system of tire-setting is a matter of guess work, as it is quite out of the question to determine just how much draft a wheel will stand without injury. With this machine you can readily and accurately determine just the sufficient draft or tightness for the tire on any and all wheels. With this machine the bolts need not be removed, and thus the felloes are not weakened or injured as by the old method—neither is the felloe burned, and as it takes but a few minutes to set a tire, persons having vehicles with loose tires are not required to wait a long time for the work to be done. This machine was in operation on the grounds, and elicited a good deal of interest.

Washing Machines.

There were several washing machines on exhibition, and among those which appeared to be of new device, was the *Hartford Premium*, by Edmund S. Bullock, Hartford, Conn. This machine consists of three or more pounders, and a rub-board combined in one and so arranged, that by turning a crank the pounders and rub-board are each worked independently of the other, keeping the clothes turning and bringing them in a different position under the pounders every time they strike. Some of the gearing of this machine was broken during its transit to the Fair, but it was operated sufficiently to show the principle as above described. Price $14.

The Defiance Washer, by Ira B. Stillman, of Almond, N. Y., consisted of corrugated rollers with springs pressing the rollers down. $5.

D. W. Seely, Cedar Hill, N. Y., showed a washer and wringer combined. $12 to $20.

Robert K. Tomlinson, Brownsburg, Pa. The farmers' washer and wringer. $24 to $50.

Steam washing boilers were also shown, but several of this kind of device have been before the public for some time.

Apparatus for Steaming Food for Stock.

It has been questioned by some whether the general introduction of steamers and the use of steamed fodder for stock will prove economical or advantageous. This is no place to discuss this question in all its bearings, but there is no doubt that steamed fodder can often be employed with advantage on many farms, and especially where considerable quantities of straw and coarse fodder are to be utilized.

Hay is now worth along the Central Railroad, in many places, $20 per ton. When cows are fed on hay alone it will take nearly if not quite 2¼ tons of hay per head to bring them through the foddering season. The expense therefor is from $40 to $50 per head. Corn is worth 75 cents per bushel, or say $25 for 2,000 pounds. Can not therefore a mixture of steamed straw and corn meal, bran or ship stuffs, in proportions to be made equally as nutritious as the hay, be substituted, and stock wintered at much less expense than upon hay alone? Now while we do not believe that steamed food is economical under all circumstances or that it pays generally to steam early cut hay which has been nicely cured and housed, still we think that most farmers can at times use a good steamer at a profit, and the high price for hay, from year to year, with its increased demand for shipping, must call for a better utilization of straw and coarse fodder than now obtains on many farms.

Among the devices for steaming food shown at the fair we notice the following:

Eagle Steamer and Caldron, E. E Sill, Rochester, N. Y We give the manufacturer's description of this device as follows:

"It is composed of two caldrons or sections, one of which is set within the other, at such distance as to afford sufficient water and steam space between to constitute an efficient generator. The outer and nether one is formed with a depressed annular extension, largely increasing the fire surface, and bringing it close to the fire. The inner one may be used as an open caldron, for drying, boiling and evaporating, and in such cases it performs the offices of a jacketed kettle. It is protected from the ordinary air currents, not only by its internal position, but also by a loose cover, which, at times when the section is employed as a caldron, may be used or not, but which at other times serves to preclude the air more perfectly and prevent loss of heat by radiation. The sections are bolted together through flanges at their rims, and set over a fire-box, and supported by the flange of the upper one resting upon a wrought iron jacket which surrounds both the fire box and nether section. The fire flues are revertible, and are formed exteriorly by the jacket, which, at points exposed to the flame, is made double, or is otherwise fortified. The fire-box is capacious, and is protected by a cast iron sectional lining, prevented from burning by outer applied air currents, which are also employed to facilitate and intensify combustion. The ash pit is ample, and can be tightly closed. Adjustable dampers are arranged for the management of the draught. The grate can be tilted, is removable, and can be easily replaced. A safety valve, for preventing excessive pressure, is provided. An automatic regulator of the supply of water is attached. Appliances for the easy disposal of soot, incrustation and sediment are furnished, and the requisite starts for the outflow of steam are affixed, which, by means of wooden, iron or rubber pipes or conduits may be extended to any vat, tank, box or other receptacle in which the process is to be performed. The apparatus is a Steam Generator and Jacketed Caldron combined. It can be employed both as a generator of steam and an open caldron, at the same time, or as a generator or caldron, and no detachment of parts is required to change from one to the other." 650 pounds, $125; 800 pounds, $150.

Anderson's Agricultural Steamer, P. P. Mast & Co., Springfield, Ohio. This somewhat noted steamer has been before the public for several years, and has high recommendations from many who have used it. 450 pounds, $120.

Farm Gates.

Hall's Improved Balance Gate, Amos Hall, Little Valley, N. Y. This is a cheap, simply constructed gate, and is well adapted to farms. It is made from 16

to 20 feet long, 8 feet 10 inches high. About one-quarter of the length of the gate is to go back of the post on which it hangs. The post is made rounding, and at the bottom of the gate there is simply a band of iron going round the post making the lower hinge. At the top of the post there is a bolt and washer—the bolt going through the top rail, thus allowing the gate to swing. A box at the back section of the gate and at the bottom is for stone to balance the gate on the posts. Gates strong, neat, durable and easily operated can be made after this pattern, and at a trifling expense as compared with other devices of this character.

Water-Wheels.

Rochester Turbine Water-Wheel, by S. B. Arnold, Rochester, N. Y., consists of six pieces only. It has a tubular gate playing between guides and wheel by which the quantity of water is regulated, giving great efficiency to partial gates and freedom from liability to accidents. The wheel is strong and durable.

The Whipple Centre Vent Water-Wheel is a durable bucket wheel with a graduating gate.

Portable Gas Machines.

There were three machines shown. *The Underground Gas Machine*, J. W. Low, Portlandville, N. Y., from 12 to 25 burners, $200 to $300. D. W. Seely, Cedar Hill, N. Y., *Double-Acting Hydro-Carbon Gas Machine*, 260 pounds, $250; and *Home Portable Gas Machine*, R. V. Horton, Breesport, N. Y.

Saw Gummers.

The only one noticed was *Mallory's Saw Gummer and Filer*, Jones & Webb, Elmira, N. Y. In this machine the emery wheel is adjustable so as to accommodate it to the tooth of the saw. The saw is hung on a pivot and is arranged on a bar of iron, the emery wheel works in every direction that a file requires to be used in filing saws, and one wheel will do as much work as would require $80 worth of files, were the latter used, 130 pounds $85.

Miscellaneous.

The Ames Plow Company showed several useful things under this head; among which was the *Garfield improved Coffee and Drug Mill*, $12; *Store Trucks*, two sizes, $6 to $12; *Railroad Baggage Barrow*, 145 pounds, $40; and *Little Giant Wheel Jack*, which is light, simple and efficient, $3 to $4.25.

Asa Bliven, Elmira, N. Y., showed patent *Milling Machine for working off Steam Engine Cross-Heads*. This is a valuable device. $50.

Lawn Mowers of five different sizes were shown by Chadborn & Caldwell Manufacturing Company, of Newburgh, N. Y., are excellent machines, $16 to $125.

Eagle Pruning Tool, by I. W. Williams & Son of Chagrin Falls, Ohio. This is a very valuable little implement for trimming fruit trees, shrubbery, &c. The knife and guard are so shaped they let the limb rest on the joint. The knife with a drawing cut cannot slide, roll the bark, or bruise the wood. It makes a clean, neat cut, and will take off a limb an inch or more diameter with very little power. We can highly recommend this implement. Weight, 3¼ pounds. Price $4.

Curtis' Patent Scythe Holder. C. C. Bradley, Syracuse. This is a handy device for holding mowing machine scythes while grinding. It is simply a frame which adjusts the tooth to the stone. $3.

Swinging Cattle Stanchions. Walter C. Gifford, Jamestown, N. Y. This is the best form of stanchion we have ever seen. They give the animal great ease and freedom, and yet are perfectly safe and substantial. In the common stanchion it is often quite difficult for cows to rise to their feet without making several attempts. The swinging stanchions yield to the animals shoulders in their forward movement, thus allowing them to rise as easily as though they were not fastened. This yielding movement also serves to prevent the animals slipping when reaching for food. By an ingenious device the stanchions are self-closing and self-fastning. We should be glad to see this stanchion introduced everywhere through the dairy region, believing that it would not only add comfort to the stock, but save many losses from accidents, besides economizing time in fastening the animals.

Eureka Feed Box Manger. W. J. & J. W. Harris, Newport, N. Y. This is an arrangement of boxes fastened to a board which is hinged at each end, and placed before the cattle. By raising the board on its hinges it falls back until it rests in a slanting position upon the edges of the boxes, thus making a good manger for feeding, hay, etc. By turning the board back, a full set of boxes are in readiness to receive meal, salt or slop for the animals. The whole thing is simple, cheap, convenient, and to be recommended.

Albright's Excelsior Feeding Manger, C. E. Albright, Muncy, Pa. This manger is more particularly for horses. It is so arranged as to allow feeding to be done from overhead, feeding room below, or next the horse, or either of them separate, without dusting or injuring the animal. The hay is fed at the side, through a vertical hinged side rack, thus allowing the animal to get out but one mouthful at a time, and that is principally caught at the ends of the straws, which must then be drawn out through the vertical hinged rack or over the grated bottom. In this way the hay is riddled and sifted entirely free from dirt, dust, seeds, and all that is injurious to the horse's health or wind. The hay manger forms a flue, as it were, carrying the light dust up and the heavier dirt down through the grated bottom below, in that way not allowing the animal to inhale any dust or dirt that might be in the hay while feeding.

Plough Clevis to adjust the draught while in motion. S. W. Hall, Elmira. Simple and good. $1.

Fish's Champion Tuyere Iron, Robert N. Short, Mechanicsburg, Pa. Highly recommended by blacksmiths for fast heating and saving coal. 40 lbs., $10.

Lane's Improved Patent Lever Set Circular Saw Mill, Warner & Green, Cambridge, N. Y. The set power and arrangement in this machine is convenient, and works admirably. Saw mill, 25 ft. carriage, 42 to 60 in. saw, 4,000 lbs., $500. saw extra. The *Advertiser* speaking of this machine, says: "There are two saw mills in operation—a portable one from Zanesville, Ohio, with engine attached, and one from Cambridge, Washington county. This is a patent of Lane's, and of such an apparent excellence is it possessed, that it was sold before it was completely set up. Its name is *Lane's Lever-set Circular Saw Mill*, and a number of lumbermen in that region of the grounds regarded it with attention." Its operation attracted much interest.

Machines for Making Fence.

These machines, while in operation on the grounds, were objects of interest to many.

The Wire Fence Machine of A. C. Betts, Troy, N. Y., is an ingenious device for fastening pickets to wires, and thus forming a wire picket fence. There are those who do not think much of wire fences on account of their liability to get out of order, such as slackening or breaking of wires caused by contraction and expanding of the metal during hot and cold weather. A dilapidated and sagging wire fence, all awry, is a very unsightly object. However, Mr. Betts thinks he has overcome some of the objections to this kind of barrier, and his machine, to say the least, did its work well and rap-

idly, and is something of a novelty. The kind of fence made consists of six wires stretched in a horizontal direction, the one above the other, and light wooden pickets, thirteen inches apart, standing perpendicular, and securely fastened by staples to each wire. The machine has six reels for the wires, which run through guides under the staple drivers. The staples hang on inclined spindles, and feed themselves. The pickets are placed upon the wires by hand, and a set of hammers drives the staples. The hammers immediately rise for another stroke, and in the meantime the picket is drawn forward by the machine to the other set of hammers, which give the final stroke, driving the staples home and perfecting the work. The pickets now made into a fence pass forward and are wound up on a reel. After a certain number of rods of fence has been thus made, it is taken from the reel and is ready to be set up. Machine, $600.

Hall's Universal Fencing Machine, S. W. Hall, Elmira, N. Y. This machine makes what Mr. Hall calls a "rough and ready fence." It is in zig-zag form; posts five feet long stand on the ground; rails or poles two to four inches, 12 feet long, with two and a quarter inch tenon at each end, and five rails to a panel. Holes are bored in the posts to receive the tenons on the poles, and this when set up forms the "rough and ready fence." This machine saws the timber the right length, the five augers bore the holes, and finish with countersink. It dresses the ends of the poles with tenons, and all this work is being done at the same time. The machine can be used for boring and countersinking posts for common post and rail fence. The machine was in operation on the ground, run by Mr. Hall's Novelty Horse-Power previously described, and the whole affair made altogether a novel show. Price of machine $150.

Land Rollers.

Land Roller, with Attachment for Sowing, C. Bartholomew, Etna, N. Y. Roller has cast-iron heads three feet in diameter; each roller three feet long, making six feet. Broad cast sower in front for sowing plaster, grass seed, etc., $85.

The Manley Roller, by Manley Manufacturing Company, Potsdam, N. Y. In this machine there are two rollers followed by a single roller. Its construction gives easiness of draft and facility in turning round, while it readily overcomes irregularities and obstructions. By disconnecting the parts it is easily stowed away. It is a well made and durable machine. $65 to $75.

Andrew Brothers, of Watkins, N. Y., also showed Field Roller with attachments.

Wood Working Machinery.

This department was pretty well represented.

The Pony Planer and Matcher, of Frank & Co., Buffalo, N. Y., and *Surface Machine*, attracted attention. Price of first, $375 to $450, and of last, $140 to $165.

The Blind and Slat Planer of Daniel Doncaster, Albany, N. Y., planes both sides of the slat with the grain, and without turning over. It rounds the edges at the same operation. The outside cutter is made in the form or shape of the material to be worked. With this machine the chips are conducted off through an elbow out of the way. 600 pounds, $250.

Johnson's Hand Power Sawing Machine. N. G. Johnson, Elmira, N. Y. In this machine it is claimed that working with a lever you get a longer stroke than with crank, also an easier motion. The guide moves in a circular slot of iron and is perfectly solid. There is a friction roller between driving pulley and arbor pulley, enabling it to run with tight belt. 8 by 4 feet, $100.

Scroll Sawing Machines.

Bengler's Patent Scroll Saw, by Dubois & Bengler, Williamsport, Pa. Two machines, one of which was a foot power. The foot power machine is about the size of a common sewing machine weighing 50 pounds, iron frame, wood top, and brass guides. The machine is operated with both feet on the treadle. The motion of the saw is 800 to 1,000 strokes per minute. The saw can be used 4 inches to 12 inches long, and 1-32 to 3-16 of an inch wide. The saw is fastened to lower guide by a nut; the top end of saw to a steel hook, connected to top of guide and spring. The top guide and connections can be taken off of the table by unfastening the top of the saw almost instantly for the purpose of inserting the saw for inside cut work. Price of large machine, $160.

Eureka Scroll Saw Machine, J. S. Mosely, Syracuse, N. Y. This machine is adapted to all kinds of scroll sawing, from the coarsest to the finest. It is convenient in operation, and does good work; is easily adjusted, and simple in construction. $165.

Weaver's Hand-Power Machine for Circular Sawing, Boring and Planing, Wm. Weaver & Co., Greenwich, N. Y. Mr. Weaver's invention consists of two large pulleys with a small one between them, so arranged on parallel shafts, that two belts passing around the large pulleys should one of them pass over the small pulley and the other under it—the small pulley rolling between the two belts in the same manner that a top is turned between the hands. The power is applied to one of the large pulleys, and to the shaft of the small one is attached, in the usual manner, a circular saw, auger, cutter-head, or any other tool to which it is desired to give a rapid rotary motion. On the end of this shaft is the balance-wheel, and a crank, that by means of a Pitman & Rocker shaft, drives the scroll saw. 500 pounds, price $150.

Spoke Planing Machine, by Chas. Perrigo, Groton, N. Y. Also a *Spoke Tenon and Spoke Finishing Machine*. These machines worked admirably. The planing machine runs off spokes at the rate of 160 spokes per hour, while the tenon machine cuts the tenons as fast as the spoke can be handled. Planing machine, 900 pounds, $350. Tenon machine, 280 pounds, $115.

The Engines.

The steam power for running the shafting in Machinery Hall was furnished by an engine of about forty-horse power. This was furnished by Henry C. Haskell, of Albany, N. Y., and was managed by Engineer Alexander Ballantine. It was a model of a good engine.

Hall & Whittemore, of Havana, N. Y., exhibited an engine both high and low pressure, which, meeting with an accident during the exhibition, was only worked a part of the time.

B. W. Payne, of Corning, N. Y., had one, which the *Elmira Advertiser* in its notice commends as "a little marvel," it runs so light and powerfully.

Planet Drills.

These drills sow garden seeds, broom corn, guano, etc., and were shown by Samuel Allen, Philadelphia, Pa., who also had on exhibition a *Double Wheel Hoe*. Both these implements are excellent for garden culture. Drill, $7 to $12; hoe, $10.

The Regulator Hand Seed Drill, by F. F. Holbrook & Co., Boston. This is a valuable garden implement for sowing all kinds of seeds. Price, $13.50.

The Holbrook Hand Cultivator has a wheel in front. The front teeth being fastened with thumb screws, can be easily removed and the cultivator shut up for narrow work, while the rear teeth are arranged with side guards, allowing it to run much closer to the plants

with safety, going as near as half an inch. The machine saves a great amount of labor in hand weeding. and thoroughly pulverizes and mellows the soil. 16 lbs., $6.50.

The Cultivator and Gauge Planter for All Seeds, by S. W. Hall, Elmira, is a very ingenious device. $50.

Mr. Hall has a novel *Machine for Picking Beans*. The beans are carried out on a revolving apron and spread out so that the bad ones are readily pushed off while the good ones pass on and are deposited in a box or other receptacle for the purpose. $8.

Novelty in Waggons.

In *Hall's Patent Waggon*, by U. S. Hall, of Watkins. N. Y., the peculiarities are in the rear springs, which serve as reach, springs and braces combined, and in the hinge-like hangings by which the forward spring is attached to the axle. The clip which sustains these hangings projects forward in a piece of heavy iron through which the thill-iron passes vertically, being secured by a nut underneath. Mr Hall claims that the advantages of this construction are cheapness. Reaches, caps to the axles, and cross bars, with their clips, bolts, etc., being all dispensed with, and a less weight in springs being used, effects a saving of 25 per cent in material and labor. Again, the weight, both in front and rear, resting on the axles close to the hub, greatly diminishes their liability to break. The seat always retains its level position, though one person be much the heaviest, and the peculiar action of the spring makes rough places appear smooth. $165. We give prices of other manufacturers who had waggons on exhibition.

James Ewing, Elmira piano box carriage, 400 lbs., $225.

Pony phaeton, 350 lbs., $350, $375; single elliptic spring phaeton, 325 lbs., $300; top buggy or road waggon, 325 lbs., $300; platform spring business waggon, $210.

Earnest Brothers, Wayne, N. Y., open buggy, 295 lbs , $500.

John T. Ayres, Elmira, N. Y., platform spring waggon, 500 lbs., $210.

Fitzgerald & Kine, Cortland, N. Y., platform spring waggon, 375 lbs., $163 ; 340 lbs., $185.

Herrick & Seely, Elmira, N. Y., business waggon, 850 lbs., $250.

Moore & Ross, Oswego, N. Y., double sleigh, $250.

Dairy Implements.

The show of dairy implements was less extensive than at some former exhibitions, but there were several novelties for butter manufacture that claim attention.

In churns, Saffell & Baldwin, of Tiffin, Ohio, showed two, one for large, and one for small dairies. This churn is of box form, standing on legs somewhat resembling the well known *Blanchard Churn*.

The paddle or dasher is worked by gearing on the outside. It claims to be a butter worker, the salting and working of the butter being done in the churn and without touching with the hand. Extra power and motion is gained by the use of gear wheels. The manufacturers thus describe its construction:

"They are made of whitewood lumber, perfectly sweet and pure, devoid of any smell or taste, at any state, whether after scalding or at any other period, for the the nature of the material, after being thoroughly seasoned by a process of steam drying, makes and keeps them fresh and sweet.

"The drum or semi-circular bottom is made of one board one inch in thickness, steamed, bent and seasoned. The end pieces being grooved and the bottom fitted exactly to the groove, it is made a perfect joint and pressed to its place; the grooves in the end pieces being first covered with a coating of lead as are also the edges of the circular bottom, which are placed and pressed into the side pieces in the same manner. The sides are then fastened to the ends with screws, not nailed, as most work of the same character is made. After securing the sides and bottom in manner described, the second and false bottom is joined on to the ends and securely nailed, rendering it impossible for the joints to separate after scalding or exposure to the sun. In this point the large majority of churns fail, from the fact that those made of staves dry out and leak, and after a short use become tainted and impure, or if made in box form, after a short time the joints separate and the churn becomes useless." Price, 25 gallons, $14 ; 40 gallons, $25; 3 gallons, $6.

Anthony's Patent Churn, by C. Slade & Co., Mayfield, N. Y. Price $6. Other churns were shown, but we saw nothing particularly new in these implements, and we hesitate to give an opinion on their merits, as a churn needs to be tried before deciding whether it be superior to others which have been long in use.

Milk Pans.

The principle of holding milk at an even temperature while the cream is rising, and the employment of cold spring water for this purpose have stimulated inventors to produce a device that can be substituted for the water pool and the spring-house. Some of these inventions have proved quite successful, and as they are much less expensive than water pools, and a large number of small vessels for setting the milk, they merit the attention of butter dairymen.

The Jewett Pans for Cooling Milk and Raising the Cream, shown by Townsend & Hyde, Malone, N. Y., have been for some time before the public, and they have a most excellent record in their practical operation. These pans are double, the lower part being for water, which is conducted in channels under the milk, and flowing also on the sides of the pans They are made of a size to hold the entire mess of milk from the herd at one milking, and four pans comprise a set, being all that is required. With these pans the milk can be kept at any desired temperature, surrounded as it is by running water. They are placed side by side on tables, and are provided with pipes, stop-cocks &c , for letting in and drawing off the water, and also with faucet for drawing off the milk independant of the water. In these pans the milk is set shallow. say from 3 to 4 inches in depth. Price of set, according to size of dairy, from $40 to $200.

The Orange County Pan, shown by Douglas & Stilson, Franklin N. Y., is somewhat similar in form to the *Jewett*, but differs in its construction by having the pans arranged in wooden vats, the one above the other on a frame. The water fills the space between the pans and the vat, on the same principle that most of our cheese vats are constructed. The advantage claimed for this device is, that the two pans arranged one above the other in a frame or rack, occupies little space, a set of four pans and two racks being used in a room 8 by 10 feet. They are probably less economical of water than the *Jewett* pans, to produce the same results. No. 1, $70 per set; No. 2, $80, and No. 3, $90.

The Cattaraugus Pans of Willard & Sawtell, Randolph, N. Y., are arranged in sets of four single pans setting within one large water pan divided by partitions, so that the water may be circulated around one single pan, or around all, as desired. The entire set of pans are arranged in a wood frame supporting them, and of convenient height to strain milk and to skim the cream. Cold or warm water may be admitted to the space between each or all the pans at the centre and top of the set by means of a funnel, with four out-

lets, conducting the water to each or all the pans at one and the same time as wanted. The water is discharged from the outer pan by a conducting pipe for the purpose. The water is conducted to the funnel by means of a rubber hose put in connection with the reservoir, which is supplied either from a running fountain or from a well of water, as the case may be. When the milk is set the desired time, the cream is removed, and a tin conductor is put in connection with the pan at an outlet in the corner of the same, which outlet extends through the water pan and is made tight by means of a screw and rubber packing. In this way the milk is drawn off. These pans were not catalogued, and we suppose were only placed on exhibition, and did not compete for premiums. Price, $65 to $105.

The Blake Pan, from Panama, N. Y., was also on exhibition. In this device the water was made to flow on the sides of the pan, and did not go underneath the milk. All these devices are for setting milk *shallow*, though doubtless the pans could be made for deep setting without changing materially the other leading features of their construction.

Hall's Milk Cooler and Cream Raiser, by AMOS HALL, East Randolph, N. Y. This is for *deep setting*, and is a new and original device, and one which promises to be useful. The size shown was adapted to a dairy of twenty cows. It consists of four tin cans, each twenty inches deep and twenty inches in diameter. Each can is placed in a wooden tub, with space between the two on the sides and bottom for the reception of water. It is held here by an arrangement of brackets. In the center of each can is placed a movable double scroll of tin, which is hung upon wires. The scroll is made by bending the tin over wires so as to make a space for water one-quarter of an inch thick by three and a half inches wide, the two scrolls, when joined together, making a thin, flat circular piece of hollow tin seven inches wide. From the upper end of the scroll a pipe is erected, surmounted by a funnel, for the reception of water. At the lower end of the scroll there is another pipe coming up and going over the tin can for the discharge of the water into the space between the can and tub. Now, in the operation of this apparatus, after the milk is strained into the can the scroll is introduced and sinks in the milk to a point below that which will be occupied by the cream. Water is now turned into the pipe leading to the scroll, and the milk receives a thin sheet of water in the center of the can, and from thence falling on the outside fills the space between the tub and can and then flows off into a reservoir. When the cream is up it is dipped off and does not come in contact with the scroll which is below. Connected with this apparatus there is a refrigerator which receives the waste water, and when it is cooled it can be used over again. After being cooled, the water is pumped into an upper reservoir of the refrigerator, and then conducted to the pipes and made to do its service over again. With a barrel and a half of water the milk from twenty cows may be cooled daily and kept at a temperature of 60° Fahr., or lower, for a week during the hottest weather of summer, while the consumption of ice to supply the refrigerator will be no more than twenty pounds per day. A syphon is used for drawing off the milk from the cans. The arrangement for drawing off water, the removal of the cans for cleansing, etc., are all simple and convenient. Price of apparatus for forty cows, $100.

PAILS OR FIRKINS FOR TRANSPORTING BUTTER IN HOT WEATHER.

The refrigerating Butter Pail shown by GEORGE N. PALMER, of Greene, N. Y., is a recent invention for transporting butter in hot weather. It consists of two tubs the one sitting inside of the other, and held in place by brackets, so that there shall be a half inch space between the two. The outside tub is about 20 inches in diameter at the top. When the inside tub or pail is filled with butter, it is covered with a cloth, and upon this is placed a perforated lid or wooden cover. Then upon the top of this is placed the tin ice chamber having a tightly fitting cover. It holds from seven to ten pounds of ice. The chamber has holes in the bottom for the escape of water formed from the melting ice, and as it passes out it flows into the space between the tubs. The whole is now covered with a lid which presses down upon the ice chamber, and also covers the outside tub to which it is fastened. When the package arrives in market the lid and ice chamber are removed, and the pail of butter may be taken out of its case for marketing, or the water may be drawn off and more ice placed in the ice chamber, and the butter thus held a few days longer. The device is quite simple, and seems well adapted for shipping packages of butter in pails of 30 or more pounds to the package. Weight, 20 lbs., $5.

National Milk Deodorizing Strainer and Cooler, by A. P. BUSSEY, of Westernville, N. Y. This implement is intended for cooling milk at the farm before starting it to the factory. It is a water and ice chamber placed in the common can with an arrangement for elevating a pail-like strainer over the can. As the milk drops from the strainer it spreads out and falls in a spray over the cooler which floats upon the milk in the can. This is a good thing. Price $5 to $10.

Churn Thermometer, J. H. SMILEY, by Edward Owen, agent, Deposit, N. Y. This is arranged so as to be inclosed in the handle of the cover of a common dash churn. $2. Another *Churn Thermometer* was shown by GEO. N. PALMER, of Greene, N. Y. $2.

Michel's Thermometer Churn, J. E. MICHEL, Paris, Ontario. This is a wooden churn having a double zinc bottom which will hold about a pail of water. The water is admitted through a pipe at the cover. The dashers are revolving, and worked by gearing. Price $10.

Cunningham's Patent Butter Worker, shown by WHEATEN LOOMIS, of Brisbin, Chenango Co., N. Y. This appeared to be a very efficient machine and easy of operation. The inventor claims that a firkin of butter can be properly worked with this machine in thirty minutes; that it does not break the grain of the butter, and that butter of different colors can be worked so evenly that no buyer can discern any difference in the shade.

Milk and Provision Safe, D. C. STEWART, Havana, N. Y. This appears to be a good device. The following advantages are claimed, viz.: That it is rat, fly and ant proof; that it gives free ventilation between each and every pan; any dish or pan can be taken from the safe without interfering with any other; all safes have a table attached that can be let down or folded up out of the way at pleasure. This table attachment serves all walking or steps in straining or skimming milk after opening the door of safe. It is only 2 feet 6 inches wide, and 4 feet 6 inches high, holding 40 pans of milk and one six-gallon crock, or dishes equal to forty feet of pantry room. $20.

STOVES, ETC.

The exhibition in stoves was large and excellent. We do not remember to have seen a better show in this department at any previous Fair of the Society. The improvement in stoves for the past few years is very marked. They are now not only made of better material, but the castings are finer, the parts are better fitted together, and while they are more tasteful in design they are made more convenient and more economical of fuel. Are we wrong, then, in saying that no

better show of stoves has been shown at the Fair than that at Elmira? We shall not attempt to give an elaborate description of everything exhibited in this department of the Fair, but may add an occasional remark from our notes.

COOKING STOVES FOR WOOD.

Many of the cooking stoves now made are arranged so as to burn either wood or coal.

Among the entries for burning wood, BUSSEY, MCLEOD & Co., of Troy, N. Y., showed their *Mammoth*. This appears to be a good fashioned stove, doors lined with tin, swing hearth slide, malleable iron door knobs, hot air draft in front door, and is provided with reservoirs. Price $60.

DANIEL E. PARIS & Co., Troy, N. Y., made a good display with their *Mansard Cook*, four sizes This has two movable reservoirs, enameled, which can be used for canning fruit, or there is a single reservoir, as desired. It has a long, large and deep fire-box, and an illuminated front, a drop in the oven to support dripping pan, wooden door knobs, and is of good pattern, with all modern conveniences—a first class stove. Price from $43 to $60.

The *Modern Vulcan*, by S. H. RANSOM & Co., Albany, N. Y., has a good fire chamber, an improved grate arranged to dump. The ash chest under the grate declines so rapidly that the ashes slide easily into the pan, and the grate is thus kept free for hot air circulation. The oven doors are tin-lined and well fitted. The covers are extra heavy, and the cast iron reservoir is copper-lined. Price, Nos. 8 and 9, $40 to $62.

New Empire, by SWETT, QUIMBY & PERRY, Troy, N. Y. The extension top has in addition to the boiler holes an opening for a hot water reservoir, through which the smoke pipe passes, and under which a warming closet can be placed. The reservoir is made low, and is of copper. No. 7, $34 ; No. 8, $38 ; No. 9, $44 ; No. 10, $46.

COOKING STOVES FOR COAL.

The *Mansard Cook*, of DANIEL E. PARIS & Co., Troy, N. Y., four styles and sizes, is of the same form as the *Mansard* for wood. Has an illuminated front to see fire; a bread toaster attached to door; the motion of the grate is below fire-box; the back of fire-box is perpendicular, in order to get rid of ashes readily; has means of regulating hot air, forcing it about reservoir; a perpendicular front oven plate, with broiling attachment in front; centers are double and ventilated; wooden door knobs, etc., etc. Price $43 to $60.

Modern Vulcan, S. H. RANSOM & Co., Albany, N. Y. The grate shaker is removed without taking out brick; can dump readily, ashes do not lodge; good ash box; has reservoir for hot air in front, at ash box; air is let in in front of oven; heavy covers; cast iron reservoir, with copper lining; no flues around reservoir; steam from reservoir passes in the pipe. $41 to $63.

New Empire, by SWETT, QUIMBY & PERRY, Troy, N. Y. The covers are braced; can rake fire from front without opening the doors; auxiliary air chamber; hot air carried around or shut off the reservoir; front oven plate made so that ashes will not accumulate. Evidently a good stove. $34 to $68, according to size.

COOKING STOVES FOR EITHER COAL OR WOOD.

The stoves shown under this head by BUSSEY, MCLEOD & Co., Troy; by DANIEL E. PARIS & Co., Troy; by H. S. RANSOM & Co., Albany, and SWETT, QUIMBY & PERRY, Troy, N. Y., need not be described, as they are similar to those previously noted. We may remark, however, that BUSSEY, MCLEOD & Co. had a very large assortment of stoves on exhibition, comprising eight different kinds for wood or coal.

Doyle's Cooking Locomotive Great America for hotels and boarding houses, nine ten-inch holes on the top and two in hearth with double acting flue, and summer and winter attachment. WM. DOYLE, Albany, N. Y. We should judge this to be well adapted to the purpose for which it is intended, the exhibitor stating that it had done the cooking for 2,000 persons. It has a double acting flue with ring dampers. The grate is divided in center with four bearings. Weight of stove, 1,550 pounds, $135 to $175.

Superb Cooking Stove for wood or coal, HICKS & WOLF, Troy, N. Y. The advantages claimed for this stove are as follows:

The sides of the stove are made with a cornice top, by which construction the top of stove is heated evenly and alike in all parts, ensuring durability and protection against the cracking of plates, a source of great annoyance and expense in most first-class stoves. Every part of the stove is perfectly fitted. The fire can be kept under perfect control by the front draught damper. The gas burning arrangement is complete, and combustion of the fuel as perfect as can be. Increased heat by hot air circulation through the oven. Perfect combustion ensured by hot air draft and burning of gases. Perfect fitting of stove in every part. It has the largest oven of any first-class cooking stove and so constructed that every inch is available. The front oven plate is very nearly straight, giving extra width on oven side. Hot air circulation gives a perfectly even oven, being protected in all parts by double plates, with current of air between them. By this principle also the oven is thoroughly ventilated, and bakes as well on the side as on the bottom. The grate is hinged at back, so that when dumped there is a clear discharge of ashes; none falling at the back side, obviating the annoyance of having to remove the coals, ashes, etc., that will fall back of grate when hung in the ordinary way. Grate is supported at front and back at each end, and is moved horizontally below the bed plate, so that there can be no catching of clinkers or coals, and the grate will always move easily. Air is admitted at front and back of fire, ensuring a perfect combustion of gas.

PARLOUR STOVES FOR COAL.

Base Burner and Base Heater, by BACKUS, BUTTON & Co., Albany, N. Y. This stove has an oven on top; it is a self-feeder; the coal goes down in back of stove. When the oven is not wanted for cooking, the doors may be thrown open and the hot air is made available. The gases escape without coming into the room on opening the top. What is particularly claimed in this stove is the carrying the heat inside the case immediately against the pipe, and feeding behind the oven. $22 to $37, according to size.

Shining Light Base Burner, by BUSSEY MCLEOD & Co., Troy, N. Y. This stove has a self-rising magazine cover; mica doors with concealed hinges; is larger in size than other stoves of same number and price; has a mill grate; the gas ring admits cool air and gases are consumed; can shake, and dump, and have stove tight so as not to admit dust in the room; four sizes. $50.

Double Acting Flue Base Burner, by WILLIAM DOYLE, Albany, N. Y. The shake-grate has two motions, vertical and horizontal. It has a revolving magazine valve to cut off feed at any time, so as to burn only the coal in the fire pot. It has a register damper to shut off the reversible flues, leaving two direct draft flues open. The reversible and direct draft flues work together forming a double acting flue. This is an excellent stove in handsome gothic pattern. $35 to $60.

Superb Base Burner, by HICKS & WOLF, Troy, N. Y. The proportion and ornamentation of this stove is good. The construction of the oven plates is such

that the strongest heat can be thrown on the outside plate, has a good arranged top and cover, a corrugated magazine which prevents explosion in carrying off gases. There is an arrangement for igniting gases at bottom of magazine, thus economizing fuel. $22 to $52.

Light House Base, by S. H. RANSOM & Co., Albany. N. Y. In this stove there is an arrangement of grate so as to clean off clinkers and cinders, thereby keeping a good fire. There is a direct radiation from the fire pot. It has straight mica windows; the flues are not liable to fill up and it has a strong draft. The peculiar shape of the magazine coming down in the back and non-liability of fire pot to burn out, are claimed to be important advantages. $28 to $40.

FURNACES.

Double Radiating Base Burner for Heating Buildings, by PERRY & Co., Albany, N. Y., Stowell, Plowman & Co., Elmira, agents. It is claimed that this heater is cheaper than others for heating buildings, and one of small size will heat any ordinary house. The outside surface is covered with wings, and there is an improvement in the cold air chamber which is made of galvanized iron. The air is brought in on the top of the furnace and divides on each side to the base. Price $175.

HALL STOVES FOR COAL.

The exhibitors were DANIEL E. PARIS & Co., Troy, N. Y. *Dining Room Cook*, $20 and $22.

S. H. RANSOM, Albany, N. Y. *Light House Base Burning Stove* with diving flue, with or without second story attachment, and with or without portable oven.

TREADWELL STOVE COMPANY, Albany, N. Y. *Laurel Wreath Base Burner and Base Heater*, No. 14, $45. With second story heating arrangement, $45.

HONEY AND WAX EXTRACTOR.

HUGH M. MOORE, of Elmira, N. Y., exhibited an *Improved Geared Rotary Honey Extractor*. It consists of a deep can made of heavy tin, and arranged with wire racks on the sides to support the combs. It is revolved by gearing. The honey frames set inside the wire racks and the honey is discharged into a can—being forced out by the rapid revolution of the machine. Price $18.

Gerster's Wax Extractor, by H. M. MOORE, Elmira, N. Y. This appliance is a great improvement over the old-fashioned method of squeezing the comb in bags to extract the wax. Steam does the work in a most efficient manner without dirt or litter. Price $8.

In drawing this report to a close it will be proper to say, that it is quite possible some implements and machines, not on the catalogue, may have been overlooked. If any omissions or essential errors have been made we shall, on due notification of the same, be happy to correct them. And, in conclusion, we desire to express our obligations to Mr. James Geddes, who had the implement department in charge, and to the various Superintendents for courteous attention, and for facilities tendered us while taking notes for this Report.

NOTE.—It is intended to publish this report in the Transactions of 1872. Manufacturers of any implements mentioned in it may, if they desire to have cuts of their implements inserted, send electrotypes to the Secretary at any time before May next.

GIFFORD'S PATENT CATTLE STANCHIONS.

The following award by the Judges in the implement department at the Elmira Fair was omitted from their report:

WALTER C. GIFFORD, Jamestown, N. Y., *Gifford's Swinging Cattle Stanchions*. Certificate of highest merit.

AYRSHIRE POINTS.

Observation teaches that form is allied to quality in cattle. So universally is this known, that a cow is always bought on personal inspection, and never irrespective of her appearance and condition. It is to the external shape that we look, to form a judgment of the internal functions; and as our experience tells us that the whole animal body is the equilibrium of structure and action arising from the pressure of many diverse causes, we are accustomed to compare in our mind product with form, and in this way to eliminate cause and effect. Thus we speak of those parts of the animal, whose form or action point to other desirable qualities, as *points*, and these points are relatively good or bad, in proportion as they indicate more or less desirable qualities.

When a sufficient number of cattle have a similar external appearance, and transmit their characteristic features in the larger proportion of cases, we call them a breed, and such differences of external form as distinguish this breed from other cattle, become the points of the breed. As inheritance is a universal law, we find that those animals which transmit to their progeny their own external form, also transmit to an equal degree their own physiological functions. We therefore speak of cattle as belonging to a grazing breed, because such have inherited the form of body and activity of tissue which predispose animals of their breed to lay on fat, and of others belonging to a dairy breed, because these in like manner have, through inheritance, the power of secreting from their blood a larger yield of milk in quality or quantity.

In selecting an animal we must look first for the points of the breed, as indicating a decidedly preponderating probability in favour of the desirable qualities pertaining to the breed; and second, those other points which are necessarily general in their nature, and which indicate qualities not confined to any particular breed, but belonging to the race; to these two systems of points fashion has added others which sometimes are correlated with uses, at other times the result of mere caprice, ornamental points as they may be called, as the black switch and tongue of the Jersey bull, etc.

As the animal form is the effect of so many varying causes, we can produce changes at will, when we can regulate these causes. Thus a power is given to the skilled breeder, which, when rightly used, adds up the variation in a certain direction, and produces the form best suited to his purposes, and his success is in direct proportion to a correct understanding of nature's laws of inheritance, selection, correlation, etc. When numbers of intelligent men are working in the same direction and for the same purposes, we see the effect more speedily, more distinctly, and the results are, from the nature of the case, more satisfactory and less liable to error. It is to the perception of necessities that we must look for this united effort toward the founding of a breed, and such perception must needs be allied to intelligence, for intelligence recognizes the useful points of an animal which are to be perpetuated and improved. When once form is known to foreshadow profit, it will not only not be rejected when secured, but sought for with the eagerness of avarice.

In Ayrshire we had the conditions for the formation of a dairy breed; a climate adapted to grasses, a soil suited to dairying, occupied by a class of rent-paying farmers of the shrewd, observing, Scotch nationality, and the exclusion of other sources of profit. The rent had to be met; the cow was to pay it Hence the inferior cow was ejected from the byre to find her way to the butcher, while only the better cows were retained and bred from. Here selection came into play. Scottish acumen soon detected a fact as to the bulls, viz.: that the milking faculty was transmitted through

"Geordie" to his progeny. We now had inheritance at work in earnest in favour of the breed, and from this time a steady advance. As ancestral excellence became intensified, it became easier to secure excellence in the progeny; and observant farmers perceived that certain marks usually accompanied certain functions, and gradually the correlation of shape and yield was eliminated, and *points* came in as helpers. In truth, points which now seem to determine the breed, were themselves formed from the necessities of the breed. To be convinced of their value, it is only necessary to refer to the animal of 1811 and those at present in the yards of our best breeders. In the Ayrshires as in the Short Horns, the recognition of the product desired, and of the value of pedigree founded the breed; the observance of points added value by producing greater certainty, discovering waste structure, and, adding greater unanimity to the efforts of breeders, allied beauty to utility.

The Ayrshire breed is now formed. Its variation between the extremes of inferior cow and superior cow is great, as in all breeds, but there is a constancy in the average herd. The typical Ayrshire cow is the largest milker yet produced by nature or art; the inferior Ayrshire cow is still superior to the average mongrel, sometimes misnamed Native. The Native cow is yet to be produced, of which more anon.

The points of the Ayrshire cow may now be considered in detail; not only those indicating the breed, but also the good cow. Let us study her aptitudes by her points.

The usefulness of the dairy cow is in her udder, and toward the udder, its shape and its yield, all the capabilities of the cow should be directed. We may first view it as a reservoir for the milk. As such, it must be large and capacious, with broad foundations, extending well behind and well forward, with distant attachments—broad and square viewed from behind, the sole level and broad—the lobes even-sized, and teats evenly distributed; the whole udder firmly attached with skin loose and elastic. Such a form gives great space for the secreted milk, and for the lodgment of the glands, while allowing the changes from an empty to a full vessel. The glands should be free from lumps of fat and muscle, well set up in the body when the cow is dry, and loosely covered with the soft and elastic skin, without trace of flabbiness. Such a covering allows for extension, when the animal is in milk, while the glands are kept in proximity with the blood-vessels that supply them. The necessities of the lacteal glands are larger supplies of blood from which milk can be secreted, and this harmonizes with the demands of the udder as a storehouse. For broad attachments, means broad belly or abundance of space for the digestive organs, from which all nutriment must originate. The blood is furnished to the glands of the udder by large and numerous arteries. As secretion is dependent on the freedom of supply of blood to the part, and a copious flow, we find branches coming from different arterial trunks and freely anastomozing with each other. Although these arteries are internal and out of sight, yet fortunately the veins which carry the blood from the udder pass along the surface, and from their size and other characteristics indicate the quantity of blood not only which they carry away, but which must have passed through the glands from the arteries. These return veins pass both backward and forward. Those passing forward are known as the milk veins, and the size of these superficial veins on either side of the belly, and the size of the orifices into which they disappear, are excellent *points* to determine the milking probability of the cow. Still better is it to find, in addition, the veins in the perineum, which also return from the udder, prominent and circuitous.

The escutcheon is now generally conceded to be a good indication of milk in the cow. This mark is sufficiently well known not to require description in detail. I think a broad escutcheon is full as good a sign as a long one; that quantity or quality mean more than shape, yet I would not discard the shape entirely. One error must, however, be avoided. It may be well to compare the size of escutcheon of cows of one breed, but never to compare the size of escutcheons in cows of different breeds. I think this point means more relative to size in the Ayrshire than in the Holstein or Dutch; and I am certain that, while it may be safe to follow it in the Ayrshire in the majority of instances, it would be equally unsafe to adopt it in selecting a Short-horn, for the obvious reason that that breed has been bred for generations for other purposes than the dairy.

The udder and its dependencies, the milk veins and the escutcheon mark, may be considered the foundation of the Ayrshire cow. These influence profit and also the shapes of the body and the form of the animal. The milk vessel is placed in the pubic region of the cow, and is protected on either side by the hind limbs. The breadth of its attachments secures breadth of body, and the weight requires also a depth of quarter and of flanks. The breadth below requires breadth of hip above, and length of bone here appears related to length of pelvis. So much for the physical portion. The physiological function of milk producing demands a great and continuous flow of blood, for it must not be forgotten that *milk is blood*, so to speak. This flow is dependent on the supply of food, and on the facilities of digestion. To gain this, a large body is required in order to hold the suitable digestive organs.

To gain further room for these, we desire to see arched ribs, depth, yet no heaviness, of flank, and the breadth of hips which we see was also required for the broad udder. To sustain this body, a strong, firm back is needed. To gain the most of our blood after it has absorbed the chyle from the digestive organs, reason shows that it should find its way freely and speedily through the system on its labours of supply and removal, cleanse itself in the lungs, and again pass on to its duties. All this points to a healthy heart, not cramped, and lungs of sufficient capacity; for the yield of milk drains much nutriment from the system, and the constitution must needs have the vigour given by healthy and active heart and lungs. In this way then the chest is correlated with the udder.

The reproductive functions require hook bones of good size, and a broad pelvis is desirable, as underlying within are the generative organs.

Thus the necessities of the body of a large milking cow require the wedge shape, and this not only from the flank, but also when viewed from above. At this stage, let us sum up the points of an Ayrshire cow, as given for the body by the Ayrshire Agricultural Association and the New York State Agricultural Society.

The whole forequarters thin in front, and gradually increasing in depth and width backward, yet of sufficient breadth and roundness to insure constitution.

Back should be straight and the loins wide, the hips rather high and well spread.

Pelvis roomy, long, broad and straight, hook bones wide apart. Quarters long, tolerably muscular, and full in their upper portion, but moulding into the thighs below, which should have a degree of flatness, thus affording more space for a full udder. The flanks well let down, but not heavy.

Ribs, behind, springing out very round and full, affording space for a large udder—the whole carcase thus acquiring increased volume toward its posterior portion.

We see that the points as given are those of utility

and that at this stage the udder points and body points are correlated.

In connection with the body and the udder, the skin is of great value in assisting our judgment. Between that portion of the external covering used for leather, and the muscle there, occurs a layer of cellular tissue, which contains a larger or smaller amount of fat cells, and the mellow handling caused by these cells indicates a free circulation throughout this meshwork. The skin varies from a thin, papery hide, covered with silky hair, to a thick, supple, elastic hide, well coated with hair, on the one hand, and a similar variation, with harsh hair and coarseness, on the other. The thin, papery hide indicates quick fattening and a delicate constitution; the thick, elastic hide cushioned on fat, and which on the flank comes into the hand almost without grasping, indicates the height of vigour, accompanied by the fattening tendency, and the possessor of this handling endures climatic changes, low quality in his food, and neglect, with remarkable hardihood, and quickly responds to full feed and good care. The harsh handler is a dull feeder, consumes much food, and generally contains more than a just proportion of offal or waste. In the Ayrshire cow we desire neither of these extremes, for it is in the milk product that we wish the food to be utilized, and it is almost an unchanging law of nature, that deficiency in one direction must be compensated for by excess in another direction, and *vice versa*. At any rate, the cow that lays on fat too quickly, is seldom a first-class milker, and how well known is it, that the cow of large yield milks down her condition. A cow that has a moderately thin, loose skin, of sufficient elasticity and suppleness of touch, without being fat-cushioned, as it were, with hair soft and mossy, or woolly, if of correct form otherwise, will usually milk a large quantity, and when she becomes dry, will rapidly come into condition. In truth, the handling of the Ayrshire cow must be good; it cannot be too good; but it must not be of exactly that quality sought for in the grazing breeds.

There, as everywhere, the dairyman must keep to his line; milk, not fat, is his profit; and in seeking excess of both, he will be liable to fall below the average of either.

It is an axiom of breeders to diminish the useless parts of an animal as much as possible, or, in other words, to reduce the proportion of those parts not conducive to profit, to as great extent as possible. Applying this rule to a dairy breed, we should desire a small neck, sharp shoulders, small brisket and small bone. Moreover, small bone usually accompanies thrift, and is universally found in improved breeds. We thus have a reason for these other Ayrshire points, which I now quote :

Shoulders, lying snugly to the body, thin at their tops, small at their points, not long in the blade, nor loaded with muscle.

Brisket light.

Neck of medium length, clean in the throat, very light throughout, and tapering to the head.

Tail long and slender.

Legs short, bones fine, joints firm.

If the dairyman's policy were otherwise, he would have to supply extra food for the support of parts useless to him, and whose larger development is of no especial value.

The next points that I shall consider are the ornamental, and these include in part the divisions I have just considered; not that they are all ornamental points only; far from it; but still as their correlations are not so obvious, it is better to class them so at present. I shall suggest, however, certain opinions as I pass on.

The head should be small—in shape either long and narrow, or broad in the forehead and short, according to the type of animal preferred by the breeder. Generally preferred somewhat dishing. The nose tapering to an expanded muzzle, with good clean nostrils. Opinions differ as to the general shape of the head. A broad forehead and short face occurs more frequently in bulls, and is generally esteemed a masculine characteristic; a more elongated face is called feminine. Yet some families of well-bred and good milking Ayrshire cows have the broad and short head, and such were, at one time, if not now, the favourites in the show yard, in Scotland.

The eye should be moderately full, lively yet placid-looking. The eye is a mirror of the disposition, and interprets the character of the cow; a fretful, irritable animal is seldom a quick fattener, and usually disappoints at the pail. It also gives expression to the features, and physiognomy aids our judgment.

The ears should be of a good size, but thin and their skin of rich yellow colour. Coarse ears are usually found on ill-bred animals, and thus may be considered, to a certain extent, indicative of general coarseness. The colour of the skin, as shown inside the ear, is usually considered indicative of the richness of the milk in butter. Analogically, this idea may be correct; but I am not aware of its ever having been experimentally proved. The ear is found notched occasionally in certain families, generally in some other families. This is a curious illustration of an injury becoming inheritable, if it be true, as has been stated, that it has arisen from a former practice of notching the ear, as a mark of ownership.

The horns should be of medium size, of fine texture, with an outward and upward turn, or inclining upwards and coming slightly inwards, according to the taste of the breeder. They should be set on rather widely apart. A coarse horn may indicate a coarse and thick hide, as there seems an intimate relation between the composition of the horn, hair, and *cutis* or hide; and the influence of climate on the horn and hair gives an appearance oftentimes of correlation between the two. If I may venture an opinion, I should say that the moist climate of Scotland appears to form a larger horn and more mossy hair than the dry climate of the United States. It is difficult, however, to eliminate the effect of breeding; and in-breeding, when used to an extreme, seems, among its other effects, to diminish the horn. It may be a theoretical consideration, whether an elongated curved horn may not indicate some lack of virility, as such a shape appears typical of the castrated male.

The neck should be of medium length, very light throughout, and tapering to the throat, which should be clean or free from loose, hanging skin. Yet a too thin neck is not desirable, as it usually indicates a delicate animal. A thick-set neck, well covered, yet not overladen with muscle, accompanies hardiness and vigour of constitution in my experience. I have sometimes thought that an extremely thin neck may be brought about by somewhat close in-breeding.

The junction of the neck with the body and over the shoulders is called the crops; on a horse it would be called the withers. A hollow behind this point is a never-failing sign of weakness. The crops should blend in easily with a thin shoulder, lying snugly to the body. This shoulder and a well defined spine produce the sharpness of shoulder so much admired.

The back should be straight, with spine well defined, especially forward. The tail long, firm in the bone, and set on a level with the back, without depression or notch. A fine tail usually accompanies fine bone, and fine bone is not only decrease of offal over heavy limbs, but accompanies early maturity and a tendency to thrift. The limbs should be fine-boned, flat-boned, and with joints of moderate size. On the forward limbs

the cow should stand low. Large joints and round bones are found very frequently on dull feeders and on animals of little profit.

The teats (the udder cannot be considered here, for in the milk vessel ornament accompanies profit, and the two are combined) should be of medium length, evenly set, and project slightly outward when the bag is full; of even thickness throughout, and of fine texture. They should be placed about one-third of the length of the "vessel" apart in one direction, and about one-half the other. When the udder is not distended, they should hang perpendicularly. Large teats, however desirable to the milker, are usually accompanied by coarseness of build in the cow. They are seldom found on well-bred animals, yet exceptionally they so occur, and are much liked. A teat should be large enough to grasp, say from two to two and a half inches in length. A shorter one would be an objection; with larger, I should fear coarseness.

In colour, the Ayrshires vary greatly. Brown red and white appears to good advantage, and is fashionable. A good quantity of white, well distributed, adds style and showiness to the animal. Yellow and white is frequently seen, yet while this colour is sometimes stated as indicating lack of hardiness, I am not aware of any proofs or argument having been brought forward to support this view. Colour is as yet a matter of taste, for its correlations are hardly guessed at; and from almost pure black, through the reds to almost pure white, are colours found on the best cows. Black spots on the skin, barely perceptible through the hair, often occur on the best cattle. Strawberry-blotched, and red and white are perhaps the more common colours. A self-coloured animal, or a roan, or an animal with white on the ears, I have never as yet seen among the Ayrshires in Scotland or in this country, when the pedigree was unquestionable.

The carriage should be light and active, the head well up, and the hind legs should not cross in walking. The condition should be neither fat nor lean, but that average which a good cow holds, when in good flesh at calving, and liberally fed while in milk.

I am unprepared to give the average weight of the Ayrshire cow or bull. In our own herd, cows weigh from 800 to 950 lbs. when in milk, and the average is about 870 lbs.

Although not connected with my subject, yet as it may be a matter of interest, I will give a few cases of the yield of superior cows. One cow, of the "Maplewood Herd," Fitchburgh, Mass., Beauty by name, gave in 1869 and '70, 8,011 lbs. of milk; in 1870 and '71, 7,922 lbs, and in 1871 and '72, 7,555 lbs., or an average of 7,829 lbs., or about 3,608 quarts a year for three years. Beauty is now 11 years old, and weighs 985 lbs., and was 325 days in milk on the average each year. Queen of Ayr, of "Waushakum Herd," South Framingham, Mass., six years old, weight 925 lbs., gave in 1870, 8,596 lbs.; in 1871, 7.135 lbs., or an average of 7,865 lbs., or about 3,624 quarts a year, milking on the average 327 days a year. Five cows gave in 1870, a year of exceptional dryness, an average of 6,984 lbs. each, and in 1871, a year of remarkable drought, 6,099 lbs. each. From the nine months of 1872, which we have recorded, we estimate the yield of five cows, for this year, to be about 7.100 lbs. apiece. These figures are not given for the average of any herd, but only as an instance to illustrate the breed. Many statements will go higher; many results will be much lower.

The value of the Ayrshire cow to the American dairyman can scarcely be overrated. In introducing animals of this breed, either as thoroughbreds or crosses, he is making a practical use of the years of effort of other farmers, which were required to bring this breed to its present perfection. With increased populaton and new markets, the farming customs of many districts are changing. Specialties are the order of the day, and, to many, open avenues to competence. The dairy farmers in New York, with rare energy and collective action, have made the cheese factory and the creamery familiar to almost every large dairy neighbourhood, have eased the toil of the farmer's family, and increased the farmer's profits. Their example, fast spreading, overleaped the bounds of nationality into Canada, crossed the ocean to England's shore; and in our own country, from the nearer east to the remoter west, factories multiply with the passing years. The effect is already seen in reduced prices for dairy products. Consumption does not keep pace with production. The farmer, in converting his milk into butter or cheese, is receiving less than two cents a quart for his milk. Yet the wages of labour are certainly not lowering; the cost of living is greater, as population and luxury comes nearer. The time for improved farming is now at hand; the necessity of our times will soon demand it. The farm poorly carried on, will change ownerships until it comes into possession of one who recognizes the demands of his times, and skillfully meets them. The factory system of marketing milk is introducing a state of things which will render it impossible for any dairy farmer to keep poorer stock than his neighbours. Increasing population, spreading toward the country from larger cities, and the development of smaller manufacturing centres, is enhancing the value of land, and thus increasing the capital invested in the farm. Profit from the farm will become yearly more difficult to make, and only improved measures, taken by thoughtful persons, will yield a return. Thus, not only education, which the system of our country affords, but intelligence, from natural causes, will be more wide-spread, and the conditions are thus developing for the formation of a native American dairy breed; and I cannot but believe that it is already under process of formation. When formed, it will be adapted to the American climate and American care and will undoubtedly be a useful breed. It may be better acclimated than the recent importations, but it requires less effort to acclimatize a valuable breed than to form one. The dairy farmer who now uses good milking Ayrshires, and breeds either to pedigree or for grades, is receiving the advantage at the present time, in advance of his neighbour who blindly waits for fate to compel him, though tribulation and toil, to slowly build up his improved breed.

The American cow will be formed from the present stock of the country, by complicated and unknown crosses, by selection and by pedigree. Failures will find their way to the butcher; the better cow will be retained. As good qualities increase, a farmer will breed for some generations in or towards one line, until finally a Bakewell or a Colling will be found who will establish pedigree or the transmission of ancestral excellences. This is a slow and uncertain process. Selection, aided by thoughtful crossing with thoroughbreds, would act more vigorously, and would hasten the result, if judicious counsel prevailed. The most important requisites are, however, three in number. First, that the farmer should generally recognize the failings of his present animals; second, should know the capabilities of thoroughbreds; and, third, should have a definite understanding as to what sort of a cow he desires.

The first can be readily learned by weighing his milk for one year. It is very easily done. A pair of spring scales are hanging in the barn, the pail is hung on, and the weight recorded on a piece of paper kept nailed to a hanging board. This requires but little trouble, and soon becomes a habit; and as the pail used is of uniform weight, the cows' yield for the year can be found

by a little addition, which would be excellent practice for the little ones of the family. A good farmer, at the late fair at Elmira, estimated the average yield of dairy cows in his county (the average of the herds he means) at 1,300 quarts. It is a poor Ayrshire herd which cannot give its 2,000 quarts under similar circumstances. A good herd will do far better.

The second point may be ascertained by the careful reading of our agricultural papers. noticeably the *National Live Stock Journal* of Chicago, making the due allowance which common sense suggests, for exaggeration of statement, exceptional circumstances and difference of locality. I can scarcely speak too well of the efforts of this paper, which is devoted to stock interests.

The third point, the knowing his desires, can be only accomplished at present by breeding toward the type of the breed which he has selected. As minute observation of cattle increase in number, and where practical farmers and scientific theorizers combine to give measure and details and the harmonizing thought, of large milking cows, then will the breeding for form stand on a strictly scientific basis, the utility of parts and their correlations will be formulated, and benefits will accrue to breeder and farmer alike. The best the dairy breeder can do at present is to seek the Ayrshire type, and if these few ideas, so crudely set forth, aid in the least, the object of the writer will have been attained.

E. Lewis Sturtevant.

Waushakum Farm,
So. Framingham, Mass., Oct. 8, 1872.

ON THE COMPOSITION AND PREPARATION OF CLAY FOR THE MANUFACTURE OF BRICKS AND TILES.*

BY PROFESSOR HODGES, M. D.

If my object were to give you an account of the history of the employment of clay for purposes of utility or ornament, it would be easy, from the full particulars respecting its technical uses in the most ancient times which are accessible to us, to show that its application as a material for the construction of buildings, and for pipes for conveying water, dates from the most remote periods. The Biblical records on this subject, especially in Genesis and Exodus, are sufficient evidence of its employment in the very infancy of society. In the 11th chapter of Genesis, we find the first allusion to its manufacture into a material for the erection of buildings, when the people said one to another, "Go to, let us make bricks;" and the same record informs us that the bricks were not like those so much employed in ancient and modern times in Eastern countries, composed of clay mixed with chopped straw, and merely hardened by drying in the sun; for they add, "burn them thoroughly." "And they had brick for stone and *slime*," or, as it is in the original, *chemar*, a word usually employed to describe asphaltum, "for mortar." The remains of numerous buildings, composed partly of burnt bricks, and partly of bricks formed of clay dried in the air, and containing particles of reeds and straw, are stated by travellers to occur in the ruined cities of the plain watered by the Euphrates and Tigris; and along the valley of the Nile there also exist remains of temples and palaces composed entirely of bricks, and some of these, like the first pyramid at Dasher, are built of bricks formed of the fine clay of the Nile, mingled with chopped straw. Rossellini describes a picture found in a tomb of the age of Thotmes the 4th, a contemporary of Moses, in which foreign captives are represented making brick. They are shown at work transporting the clay and mixing it with straw. And some bricks discovered, which bear impressed upon them the name of this king, may have been the very bricks manufactured by the Israelites. The task, however, which I have undertaken on the present occasion, is merely to give you some information, which science is capable of affording us, in connection with the rapidly-extending employment of clay in the manufacture of tiles and bricks.

In almost every part of Ireland, there are to be found deposits of clay suitable not merely for the manufacture of bricks, but capable of being moulded into tiles for draining and other purposes. Frequently, however, from want of knowledge, excellent clays are condemned as useless, or, when an attempt is made to work them, they disappoint expectation. In consequence of the greatly-increased demand for tiles in drainage operations, it is of great importance that the public should be made aware that there are very few clays which may not, by proper management, be rendered available to the tile-maker. Few persons, however, even of those who have for years been occupied in tile-works, have any clear notions of the properties, either mechanical or chemical, which are essential to a good tile clay. Questions on this subject have been so frequently addressed to me by members of the Society, that I shall endeavour to make my observations in reference to it as clear and precise as possible.

In the first place, it will be useful briefly to consider the information which science gives us respecting the raw material of the manufacture. The substance which is known as clay may be described as the product of the decomposition of aluminous minerals. It is found of various ages, and exhibits great varieties of constitution; but in all its varieties the predominating ingredients are the two chemical compounds, *silica* and *alumina*.

Silica, or the earth of flints, is familiar to us in a great variety of forms. In the transparent rock crystal, or Irish diamond, and in many precious stones, we find it in an insoluble, crystalline condition. It may, however, be made to unite with the alkalies, potash and soda, so as to form compounds which, according to the amount of alkali contained in them, are more or less soluble in water. By the employment of a larger amount of alkali, what is termed "water glass" is formed, and the silica and soda united to form a compound which dissolves readily in water, and which has received various useful applications in the arts. When we heat together sand and soda, you are aware that glass is produced; and when only a small amount of the soda is used, the transparent compound resists for centuries the dissolving action of water. Yet even ordinary glass is not completely insoluble in water. Compounds of silica, or, as they are termed by the chemist, *silicates*, compose the greater number of rocks; and in gravels we find a compound named *felspar*, which contains silica in combination with alumina and potash.

The pure earth, *alumina*, which forms the basis of clay, and is the main constituent of every fertile soil, is so called from having been obtained in its greatest purity from alum, which is a compound of alumina, potash and sulphuric acid. It may be separated, in a soft and jelly-like condition, by adding to a solution of alum some carbonate of potash, when the alumina falls, giving the solution the appearance of starch jelly and water. We have examples of native alumina in the ruby, the sapphire, and in corundum and emery. When precipitated from its solution it is readily dissolved by alkalies, but if exposed to a strong heat it gives up its water, decreases in bulk, and is no longer soluble. Sir Humphrey Davy demonstrated that this earth must be an oxide, or compound of the element oxygen with a

* From the *Journal of the Chemico-Agricultural Society of Ulster*, September 25, 1872.

metal. It was, however, reserved for Wöhler, of Gottingen, first to separate and investigate the metal which has been named *aluminium*, and which, as alumina forms about a tenth part of alum, must constitute about six per cent. of that substance. The new metal was first obtained in quantities by the French chemist Deville, by the agency of sodium on chloride of aluminium, and also by Price and Rose, by employing a mineral named cryolite, a fluoride of aluminium and sodium, which is found in large quantities in Greenland. At present, in England, it is prepared from a mineral named *bauxite*, so called from the locality in France in which it is found. This mineral contains 57.4 per cent. of alumina.

In all the varieties of clay, as I have stated, we have a compound of the oxide of this metal, *alumina*, with *silica*, and the term clay serves as a general expression to designate all those products of the decomposition of minerals in which silicate of alumina predominates. Thus it includes an extensive series of mineral remains derived from the decomposition of felspar, which, as has been stated, in its most abundant form is a compound of silicate of alumina and silicate of potash. By the action of air and water on the granite and other rocks, this mineral is gradually decomposed, disintegrated, and the silicate of potash washed away, while the insoluble silicate of alumina is left behind as clay. When the clay is nearly pure silicate of alumina, it is most suitable for the purposes of the porcelain manufacturer, and is termed porcelain clay. The porcelain clay of Meissen, in Saxony, in every 100 parts contains 52.8 of silica, 31.2 of alumina and 2 of potash. Frequently this pure clay is carried away from the place where it is separated from the rock, mixed with other ingredients and again deposited. Thus the composition of ordinary clays may vary very much. Among the foreign substances which may become mixed with the pure silicate of alumina, we frequently find sand of various degrees of fineness, carbonate of lime, red oxide of iron, gypsum, and the alkalies, potash and soda. The presence of these foreign substances, we shall see, materially affects the adaptation of the clay to various uses. All kinds of clay form, with water, a more or less plastic, tenacious paste. Those which are very plastic are known as *fat clays*, while those of inferior tenacity are named *poor clays*. The greater the amount of alumina in proportion to the silica present, the more plastic the clay. All clays lessen in volume when strongly ignited in the fire, and are rendered insoluble in water and acids; but the presence of any of the foreign substances mentioned, which act as fluxes, tends to render them more or less fusible in the fire. The presence of oxide of iron, when in minute quantity, produces but little effect upon the colour of the clay; when a larger amount is present, it communicates to it a yellowish tinge; while a still larger quantity renders it of the red colour we observe in the common tiles and bricks of this country. The presence of much sulphate of lime in clay is injurious. That mineral is deprived of its water in the fire, and converted into the condition of burnt gypsum, which again, in the tiles containing it, attracts water, and causes the clay to crack. In many clays, also, we find particles of the well known mineral, *mica*, present. Forehammer tells us that the yellow clay of Denmark consists of granite, the felspar of which has been altered whilst its mica remains unchanged. Iron pyrites, the shining particles of which may be observed in the clay in some districts, after burning, rapidly decomposes and becomes sulphate of iron, destroying the consistence of the tiles. In burning such clays, the smell of sulphur evolved shows the nature of the impurity.

In the first place, with respect to the *mechanical* composition of a good tile clay: (*a*) it should be free from stones, and when cut with a knife should present a uniform, greasy-looking surface, free from the appearance of coarse sand; (*b*.) when a portion of it is bruised in a mortar and mixed with water, and the water, after remaining in the mortar five minutes, is poured off, with the finely divided matters suspended in it, and the washing is repeated so long as the water, *after five minutes of rest*, carries away any suspended matter, there should remain in the mortar not more than 5 to 10 per cent of sand. A *strong* tile clay will possess the properties just mentioned, and when carefully managed, and moulded in the tile machine by an experienced workman, will be found well adapted to the manufacture of thin light tiles and pipes. Such clays, however, require careful "handling," and, from drying imperfectly in the sheds, frequently crack in the kilns; they are also exceedingly difficult to burn, requiring a strong heat. *Pure pipe clay* and porcelain clay are the most infusible of all forms of clay, and consist merely of two substances, silica, or the earth of flints, and alumina. The ordinary clays, however, used in making bricks and tiles, contain, as already stated, in addition to the two substances mentioned, other matters which greatly modify these characters, and especially their fusibility. These substances which act as fluxes, are oxide of iron, lime, magnesia, and the alkalies, potash and soda.

The pure porcelain and pipe clays, as you may recollect, are found to consist merely of silica and alumina, while the composition of some of our Irish tile clays will be illustrated by the analyses of specimens which have been examined in my laboratory. The specimens, in the 100 parts, consisted of:

	Ballymacarrett, Down.	Dungannon, Tyrone.
I. By washing.		
Clay and fine sand	85.23	
Coarser sand	14.77	
	100.00	
II. By analysis.		
Organic matter and combined water	2.16	7.51
Oxide of iron	8.14	8.05
Alumina	6.05	7.84
Carbonate of lime	3.85	0.77
do magnesia	1.19	0.03
Salts of potash and soda	0.51	0.38
Alumina in state of silicate	14.05	18.25
Oxide of iron do	....	0.16
Lime do	0.79	0.80
Magnesia do	....	0.99
Potash and soda do	1.60	0.23
Silica	59.64	59.99
	100.22	100.00

	Ballynacree, Co. Antrim.	Anacloy, Co. Down.
Organic matter and combined water	10.36	4.60
Fine sand and silica	64.46	69.40
Peroxide of iron	10.28	13.70
Alumina	10.28	11.00
Lime	No trace.	0.44
Magnesia	0.26	1.10
Alkalies	3.30	....
	98.94	100.24

The silica in clay is not always in chemical combination with the alumina, but diffused through it, as sand of various degrees of fineness. The effect of the heat of the kiln upon it will depend chiefly upon the amount

of the infusible materials, silica and alumina, present; therefore by ascertaining, by a chemical analysis of the clay, the proportion of these two ingredients, which in a good clay should amount to about 85 per cent. we may generally estimate its value. But when the silica present is not in a state of very minute division, when it forms coarse gravel, it interferes with the plastic qualities of the clay. On the other hand, when a very large proportion of alumina is present, the clay is indeed exceedingly tenacious, but at the same time, when moulded into tiles, it dries with great difficulty, and frequently retains so much water when placed in the kiln that the result is, when it is fired, great numbers of the tiles are cracked. The most rapidly-drying clays are those which upon washing with water are found to yield some finely-divided sand; and the obvious method of improving the quality of those clays which crack in the kiln, is to add to them a proper amount of fine sand. In the manufacture of bricks and heavy pipes of clay, this is especially necessary; and usually the fine road scrapings of some of the roads in the neighborhood of Belfast, where whinstone is used as road metal, is selected by our tile burners for this purpose.

Clays which contain a considerable amount of any of the substances which act as fluxes (lime, etc.), when too strongly heated, melt and run, and therefore require that a comparatively low temperature should be applied. The infusibility of such clays may be increased by the addition of more infusible clays, or fine silicious sand. Frequently the lime is found forming nodules in the beds of clay, and may then be separated by mechanical means, as by screening the clay. In such cases the clay should not be puddled previous to screening, as by such means the crushed lime would be diffused through the mass. Very pure clays are to be preferred for the manufacture of thin pipes and delicate earthenware articles, but at the same time they require a greater temperature to be applied in the kiln, and thus increase the cost. In such cases, it has been found useful to add some fine ground lime or chalk to the clay in the pug mill, which increases its fusibility and also gives the articles a finer surface. The practical deductions from our statement of the circumstances by which the qualities of clays are modified, may be usefully expressed in the following summary:

1. When rich clays dry slowly and crack in the kiln, they may advantageously be mixed with a portion of fine silicious sand.
2. The tenacity of clays containing coarse gravel or stones, may be increased by screening, or washing, so as to separate the clay from sand and stones.
3. When clays run in the kiln, the defect may be corrected by adding to them some silicious sand.
4. When rich clays are found costly to burn, the expense of fuel may be lessened by a proper addition of chalk or lime.

"LAWES' CHEMICAL MANURE COMPANY LIMITED."

The prospectus has been issued of "Lawes' Chemical Manure Company Limited." It states that the company is formed for the purpose of acquiring and carrying on the extensive business of Mr. J. B. Lawes. The capital is 600,000*l*., in 60,000 shares of 10*l*. each. For the extensive plant, manufactories, freehold premises and goodwill of the business, Mr. Lawes is to receive 300,000*l*. The directors (most of whom are practically acquainted with chemical manure manufacture) report that a strict investigation into the past year's transactions shows that Mr. Lawes' profits exceeded 63,000*l*. The increasing consumption of chemical manures, assisted as it is by the decreased supply of guano from the Chincha Isles, and the uncertain quality of that from the new Guanappe Island, the directors believe will assure at the very lowest estimate a dividend of 10 per cent. The directors have secured the services of Mr. Chaston, who for the past 15 years has managed the business, and as they propose to make little or no alteration in the existing business arrangements, the whole affair will be taken over in its present excellent working condition. It is understood Mr. Lawes now retires from business, but will for a time give his successors all the help necessary in the still further consolidation of the business; in addition to which he says: "It is my intention to devote the remainder of my life to scientific agriculture, and I propose, at an early period, to place in trust my laboratory and experimental fields, with the sum of 100,000*l*., the interest of which, after my death, will be applied to the continuance of the investigations which have been carried on for so many years at Rothamsted."

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Twenty copies of the Twenty-sixth Annual Report of the Ohio State Board of Agriculture, with an Abstract of the Proceedings of the County Agricultural Societies, for the year 1871. Columbus, 1872.

Results of a Series of Meteorological Observations, made under Instructions from the Regents of the University, at sundry Stations in the State of New York. Second series. Prepared from the original returns by Franklin B. Hough. Albany, 1872.

Agricultural and Aboricultual Journal of the Prussian Provinces. Nos. 26, July 1, 1871, to 52. December 30, 1871, and 1, January 6, 1872, to 13, March 30, 1872. Königsberg.

Report of the Sessions of the Class of Mathematics and Physics of the Royal Bavarian Academy of Science at Munich. 1871, part I and part II.

Oversigt over det Kongelige Danske Videns-Kabernes Selskabs Forhandlinger og dets Medlemmers Arbeider. No. 1, 1871. Copenhagen.

Journal of the Bavarian Agricultural Society at Munich, for the year 1871. Also the Domestic and Agricultural Kalendar for 1872.

Monthly Journal of the French National Academy, Agriculture, Manufactures and Commerce, and of the Society of Universal Statistics. May, 1872. Paris.

Journal de la Société Centrale d'Agriculture of Belgium. April and May, 1872. Brussels.

The following have been donations to the Museum:

Geradus Winans, Glenville, Schenectady county, N. Y.; a powder horn and belt used during the revolutionary war.

Adam A. Talsy, Princetown, Schenectady county, N. Y.; specimens of timothy grass, growth of 1872.

George H. Niver, Coeymans, N. Y.; specimen of wood showing a peculiar growth.

Captain Lucius Moody, Canton, St. Lawrence county, N. Y.; a crowbar made by the "mechanics of Dannemora" (prisoners at Clinton prison) out of "experiment iron" from State ore, and presented by them to Silas Wright, when Governor, and which after the death of Mrs. Wright, became the property of Captain Moody.

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THE JOURNAL

OF

The New-York State Agricultural Society.

VOL. XXIII.] ALBANY, JAN. AND FEB., 1873. [NOS. 1 & 2.

OFFICERS FOR 1873.

President—BENJAMIN F. ANGEL, Geneseo, Livingston county.

VICE-PRESIDENTS.

1st district—JOHN D. WING, 74 Beaver st., New York.
2d district—EDWIN THORNE, Millbrook, Dutchess county.
3d district—DANIEL DONCASTER, Albany, Albany county.
4th district—FRANK D. CURTIS, Charlton, Saratoga county.
5th district—JAMES GEDDES, Fairmount, Onondaga county.
6th district—ALEXANDER S. DIVEN, Elmira, Chemung county.
7th district—ROBERT J. SWAN, Geneva, Ontario county.
8th district—WILLIAM H. PENDRY, Albion, Orleans county.

Corresponding Secretary—THOMAS L. HARISON, Morley, St. Lawrence county.

Recording Secretary—WILLIAM H. BOGART, Aurora, Cayuga county.

Treasurer—LUTHER H. TUCKER, Albany.

Executive Committee—ADIN THAYER, JR., of Rensselaer (P. O., Hoosick Falls); HARRIS LEWIS, of Herkimer (P. O., Frankfort); JOSEPH JULIAND, of Chenango (P. O , Bainbridge); WHEELER H. BRISTOL, of Tioga (P. O., Owego); WILLIAM M. HOLMES, of Washington (P. O., Greenwich); ISAAC H. COCKS, of Queens (P. O., Old Westbury); JOHN MANLEY, of Cattaraugus (P. O., Little Valley); CHARLES D. MILLER, of Ontario (P. O., Geneva).

EX-PRESIDENTS.

1841	Joel B. Nott,	1857	Alonzo S. Upham,
1842	James S. Wadsworth,	1858	William T. McCoun,
1843	James S. Wadsworth,	1859	Abraham B. Conger,
1844	John P. Beekman,	1860	Benj. M. Huntington,
1845	Benj. P. Johnson,	1861	George Geddes,
1846	John M. Sherwood,	1862	Ezra Cornell,
1847	George Vail,	1863	Edward G. Faile,
1848	Lewis F. Allen,	1864	James O. Sheldon,
1849	John A. King,	1865	Theodore C. Peters,
1850	Ezra P. Prentice,	1866	John Stanton Gould,
1851	John Delafield,	1867	Marsena R. Patrick,
1852	Henry Wager,	1868	Thomas Hall Faile,
1853	Lewis G. Morris,	1869	Samuel Campbell,
1854	William Kelly,	1870	Solon D. Hungerford,
1855	Samuel Cheever,	1871	Richard Church,
1856	Theodore S. Faxton,	1872	Milo Ingalsbe.

Chemist to the Society—CHARLES H. PORTER, M. D., Albany.

Mechanical and Consulting Engineer—HENRY WATERMAN, Hudson.

Consulting Veterinarian—Prof. JAMES LAW, M. R. V. C., Ithaca.

PLACES AT WHICH THE FAIRS HAVE BEEN HELD.

1841, Syracuse; 1842, Albany; 1843, Rochester; 1844, Poughkeepsie; 1845, Utica; 1846, Auburn; 1847, Saratoga; 1848, Buffalo; 1849, Syracuse; 1850, Albany; 1851, Rochester; 1852, Utica; 1853, Saratoga; 1854, New York; 1855, Elmira; 1856, Watertown; 1857, Buffalo; 1858, Syracuse; 1859, Albany; 1860, Elmira; 1861, Watertown; 1862. Rochester; 1863, Utica; 1864. Rochester; 1865, Utica; 1866, Saratoga; 1867, Buffalo; 1868, Rochester; 1869, Elmira; 1870, Utica; 1871, Albany; 1872, Elmira.

State Agricultural Rooms.

The Office of the Society is in the Agricultural Hall, corner of State and Lodge streets, Albany; and all communications on business of the Society should be so addressed.

ANNUAL MEETING.

Pursuant to amendment of the Constitution adopted at the Annual Meeting of 1872, the Annual Meeting will hereafter be held on the Wednesday succeeding the third Tuesday of January in each year, at the city of Albany.

Annual Meeting of 1874, January 21st.

New-York State Agricultural Society.

EXECUTIVE MEETING.

January 21, 1873.—Present, the President, Vice-Presidents Thorne, Doncaster, Curtis, Geddes and Angel; the Secretaries; the Treasurer (for part of the session); Messrs. Thayer, Swan, Juliand and Bristol, of the Executive Committee, and Ex-Presidents Patrick, Campbell, Church and Conger. A telegram, giving reasons for non-attendance, was received from Vice-President Diven.

The occupancy of the Assembly Chamber during the evening of the day of the Annual Meeting was resigned in favour of the State Military Association.

The Secretary presented the report of the Chemical Committee in relation to the analyses by Mr. Habirshaw of samples of guano purchased in New York by the Committee for that purpose, and on motion of Mr. Swan it was

Ordered, that the report be published in the Journal, and that slip copies be furnished by the Secretary to the agricultural papers as soon as possible.

Ex-President Gould was authorized to have drawings made of the internal structure of the various forage plants treated of in his work now in preparation for the Transactions of the Society, so as to show their appearance under the microscope.

January 22.—Present, the members present at previous meeting, and Vice-President Pendry.

Mr. Lewis and Ex-President Conger were appointed a Committee on essays, etc.

Ex-President Church was appointed to confer with the officers of the State Military Association, with the view of preventing the concurrence in the future of the annual meetings of the Association and the Society, and subsequently reported that the change desired had been made.

Ex-President Conger presented a minute in relation to the death of Ex-President George Vail, and on motion it was ordered that the minute be entered upon the record of the proceedings of the Executive Committee, that it be read at the Society's meeting this day, and that a copy be sent to Thomas Vail, Esq., as representative of the family of the late Ex-President.

The Secretary presented a letter from Dr. Asa Fitch, resigning the office of Entomologist to the Society, as follows:

SALEM, N. Y., *January* 20, 1873.

Executive Committee of the New York State Agricultural Society:

Gentlemen—You will please excuse me from further serving as Entomologist of the Society.

There are a few of the insects which were destroyed by vermin in the Museum, which are yet remaining to be replaced. These I shall expect to furnish as soon as I can meet with specimens of them.

A lameness, which for some days has rendered it impossible for me to endure a boot upon my foot, prevents my attending the Annual Meeting.

Respectfully yours, ASA FITCH.

Whereupon, on motion of Ex-President Conger, it was

Resolved, That this Board, in severing the connexion which Dr. Fitch has maintained for a period of more than eighteen years with the Society as its Entomologist, desires to record upon its minutes that this severance results simply from the withdrawal of the appropriation by the State, which constituted the only source of his scanty remuneration for valuable scientific services.

Resolved, That we rejoice in the opportunity which those years have afforded Dr. Fitch of building up, in his department of natural history, a reputation for faithful and accurate investigation which will survive to other times.

And it was ordered, that a copy of the foregoing resolutions be transmitted to Dr. Fitch.

ANNUAL MEETING.

The Society met in the Assembly Chamber in the Capitol, on Wednesday, January 22, 1873, at one o'clock P. M., the President, Milo Ingalsbe, of Washington County, in the chair.

The report of the Executive Committee was read by the Corresponding Secretary, as follows:

REPORT OF THE EXECUTIVE COMMITTEE.

The year just closed has been for our State one of a somewhat exceptional character in its relations to the farmer. The season began with excessive drought and low temperature, which prevailed until the latter part of the month of May. After that time, and until harvest was somewhat advanced, there was abundance of both heat and moisture. The latter part of the harvest season was generally excessively wet, the rains being both heavy and frequent. The autumn was all that could be desired, and the change from that season to winter, though late, was sudden. The results of these peculiarities of the season, speaking for the State generally, are, that we have had a very inferior crop of winter wheat, and a large yield of spring-sown grains, a good deal diminished in value and enhanced in cost by a protracted and expensive harvest. The hay crop is a fair average; corn a large and well-ripened crop; potatoes in many districts a light yield, with a good deal of loss by disease. To the grazier the season has been a most favourable one, and the dairy farmers have made a large product, a portion of which, however, was of inferior quality.

To the Society the year 1872 is a memorable one from the fact that it has inaugurated the system towards which the policy of the Society has for some time been directed: the holding of its annual exhibitions at certain fixed points, upon grounds permanently set apart for the purpose, and with buildings of a permanent character. An act was passed by the Legislature at its last session, by which the Supervisors of the county of Chemung were empowered to raise by tax or by the issue of bonds the sum of fifty thousand dollars for the purpose of purchasing grounds and erecting buildings at Elmira for the State Fairs, upon certain conditions stipulated for, and which the Society agreed to, the chief points being that the Society should hold its fairs at Elmira at least once in three years for twelve years, and thereafter as frequently as at any other one place in the State; that the grounds might be used for the county fairs in the years in which they were not occupied by the State Society, and that, upon the disuse of the same by the State Society, or in the event of its dissolution, the land should revert to the county.

The Board of Supervisors having voted to raise the money, as authorized by the act of the Legislature, and their action having been confirmed by the people of the county by a large majority, at a special election held on the 14th of May, the Society entered into an agreement with the Board of Supervisors in the terms already recited. A suitable plot of ground, about 2¼ miles north of the city of Elmira, was selected, and the purchase negotiated. Certain parties, however, interposed, and instituted legal proceedings to prevent the issue of the bonds of the county, and it was not until the last of June that the question was judicially decided, the acts of the Board sustained, and the bonds issued. Out of the proceeds of the bonds the sum of $20,500 was paid for fifty acres of land, and $29.500 was handed over to the Society to be applied to the erection of the buildings and other necessary fittings and improvement of the grounds.

It was, of course, evident that with no larger sum at command, though liberally supplemented out of the Society's own resources, the greatest economy would be necessary. The Society therefore instructed the architect employed to prepare plans for buildings of a very unpretending character, though neat and substantial. On the completion of the plans they were at once submitted to contractors, but in consequence of the person to whom the contract was first awarded declining to accept it, and of a second contractor abandoning the work after executing the papers, but before commencing operations, another vexatious delay ensued, and it was not until the 7th of August that the work was fairly begun. That it was completed so far that the buildings, though to a considerable degree deficient in construction, were yet available for the fair, is due to the energy of the contractor, Mr. Charles C. B. Walker, of Corning.

The grounds lie on the west side of and adjoining the Erie Railway, and are bounded on the south by a wide avenue, and on the east by the new projected and partially opened avenue from Elmira to the village of Horseheads. The soil is gravel, of a very open character, and the surface somewhat undulating, on account of which considerable outlay for grading was required. The buildings consist of a row of 165 horse-stalls on the north line of the property. Next south, and on

the west side, between the railway and the track graded for the exhibition of horses. are 72 swine-pens in 8 rows; then 108 sheep-pens in 4 rows. Next come the stalls for cattle, viz., 40 bull-stalls in 2 rows, and 220 stalls for cows, etc., in 5 rows. The poultry building, 108x50 feet, comes next, and completes the range of buildings for live stock.

The other exhibition buildings are Machinery Hall, cruciform in plan. each arm being 50x48 feet, and having in all 12,000 feet of floor surface; Mechanics' Hall. 204x54 feet; Farmers' Hall, 96x50 feet, and Floral Hall, 84x50 feet. There are also an octagon building, 30 feet in diameter, fitted up as a ladies' waiting room; a police office, and a building containing the offices of the President and Superintendent and the business and ticket offices.

All the buildings are of wood, with shingled roofs (excepting part of the roof of the office building, which is of tin), and they are all painted of a neat, uniform colour. The poultry building and the four exhibition halls have trussed roofs of strong but simple design, and are lighted partly from the roof. The grounds are enclosed by a picket fence, which so far has proved quite as satisfactory as the tight board fences usually built around our temporary grounds. To make the arrangements complete, there are yet required two more exhibition halls, one for stoves and the other for carriages, and a cottage for a keeper of the grounds. There will probably also be more stalls and pens needed at the next visit of the Society to Elmira, and a provision of seats by the side of the horse course and elsewhere about the grounds would he a desirable addition. A good deal remains to be done also in grading, seeding, and planting.

The Executive Committee have already in a public manner expressed their sense of the public spirit and liberality of the citizens of Chemung County, who have been the first to supply the Society with a permanent place of exhibition, and their return will beyond question be such as amply to justify the expense they have incurred.

The expense has also been very great on the part of the Society—greater than could be justified by any considerations except those of the necessity and justice of providing structures and conveniences for the safety and favourable display of the valuable stock and goods of exhibitors; and the Committee have the great gratification of recording the satisfaction with the arrangements in general almost unanimously expressed by the contributors to the show. It is not unreasonable to expect that with suitable accommodations will come an increase of the number of exhibitors, and that the fairs will thus be made at once more attractive and more useful.

The exhibition at Elmira may fairly be termed a very respectable one. The department of implements and machinery, of which a very full report has been published in the Society's Journal, was extremely well filled, and contained a number of new inventions and adaptations. The show of farm and dairy products was a large and good one. That in the horticultural department was noticeable for the very meritorious displays made by numerous amateur exhibitors. In the live stock classes the show of sheep and pigs was remarkably good, the quality of the animals being very superior and the classes generally well filled. The show of cattle, had all the animals entered been on the ground, would have been one of the best ever made at our State fairs, and notwithstanding the default of a number of breeders of repute whose entries appeared upon the catalogue, the numbers in most of the classes were up to the average, with a good proportion of really first class animals. The show of horses was very good in the classes of breeding stock, but inferior in numbers and quality in those of harness and other work horses. The exhibition in general was satisfactory in every respect but that of attendance, which from various causes was much less than might have been expected.

The reports of county and town societies and Farmers' Clubs, so far as yet received, indicate a generally satisfactory degree of prosperity.

With the exception of the remarkable occurrence of influenza in an epizoötic form, from which almost all the horses in the Northern States have suffered, there has been no serious loss by diseases among our flocks and herds duing the past year. There was at one time a suspicion that some cattle suffering from Texas fever had been brought into the State, but it was probably unfounded, at any rate no cases were definitely reported. The epizoötic influenza which was first heard of in the neighborhood of Toronto and thence spread in a rapid but most capricious progress over the Middle, Eastern, Western and some of the Southwestern States, and is even at this time moving over the plains towards the Pacific coast, has not only caused serious loss to the farmer but seriously affected all classes and all interests. Though a well known disease, generally mild in type and happily requiring rather judicious care than a high degree of veterinary skill for the treatment of the great majority of cases, its cause and origin, indeed even the means by which it is propagated, are as yet obscure It is to be hoped that the experience gained and the facts collected during this, probably the most serious and extended prevalence of the malady that has ever occurred, may enable the profession to elucidate what is at present so mysterious.

Complaint having been made to the Society that a large quantity of adulterated guano was being sold in the city of New York, the Executive Committee in May last entrusted the investigation of the matter to a competent sub-committee, and upon learning that such an investigation was contemplated, Mr. William M. Habirshaw of New York, a professional chemist of high standing and holding the office of analyst to the chemical trade in that city, offered his services to the Society gratuitously. It was considered best to obtain samples for analysis from farmers, out of parcels purchased by them for actual use, but after a good deal of effort and correspondence it was found impracticable to do so. The Committee therefore caused purchases to be made of one bag of guano from each of ten dealers in the city, and samples from these were submitted to analysis by Mr. Habirshaw. The report will be published in the Society's Journal, and it is believed that the facts disclosed are such as to call for a prompt remedy.

Two of the Ex-Presidents of the Society have died within the year. Mr. George Vail, of Troy, whose death occurred on the 7th of August last, had from age and infirmity retired for some years from active participation in the affairs of the Society. He will be recorded in the history of American agriculture as one of the first to bring enterprise, judgment and capital to aid in the improvement of our live stock by importing and successfully breeding the highest type of Short Horns. Mr. Thomas Hall Faile, of New York, who died at Nice in the South of France, on the 13th inst. was up to his last moment one of the most active as well as the most influential and most valued of the working members of the Society, and his sudden removal from its ranks in the height of his usefulness and vigour is not only an affliction but a calamity.

On motion of Ex-President Patrick, the report was accepted and adopted as the report of the Society to the Legislature.

The Treasurer being absent on account of the serious

illness of his father, his report was read by the Secretary, as follows:

LUTHER H. TUCKER, *Treasurer, in account with* THE NEW YORK STATE AGRICULTURAL SOCIETY.

Jan. 22, 1873.	*Dr.*
To receipts since last report, to wit:	
Annual memberships................	$572 00
Life memberships	1,010 00
State appropriation of last year	1,706 25
" of this year	1,706 25
State appropriation for entomologist	1,250 00
Supervisors of Chemung County........	29,520 75
Thomas Hall Faile, special premium....	200 00
James Vick, special premium..........	180 00
Ticket sales at State Fair............	18,958 15
Other sources "	601 67
Interest account..........	1,484 98
Miscellaneous receipts................	78 01
Total receipts of the year..........	$52,163 01
To cash and securities on hand per last report, Feb. 14, 1872	29,325 04
	$81,488 05

Jan. 22, 1873.		*Cr.*
By payments since last report, to wit:		
Premiums, etc., at winter meeting, schedule A		$193 57
Premiums, etc., of previous years, B....		222 25
Salaries and clerk hire, C............		4,542 82
Incidental expenses, D..............		325 13
Postages, E........................		346 01
Library and museum, F..............		317 06
Printing and stationery, G...........		754 58
Entomological, veterinary and chemical, H,		1,175 80
Premiums, etc., at State Fair, Elmira, I,		8,878 42
Expenses State Fair at Elmira, to wit:		
Services of superintendents, etc..................	$1,496 50	
Magistrates, detectives, police, etc.................	720 00	
Gatekeepers, laborers, etc..	605 00	
Business office, etc.........	520 58	
Ticket office	325 00	
Forage bills..............	910 03	
Advertising bills	752 39	
Steam power, shafting, fittings, etc..............	1,458 94	
Refreshment, hotel, livery, and other bills	791 67	
Furniture, hardware, fittings, etc....................	871 61	
Freight bills..............	243 71	
Flags, stoves, fuel, and miscellaneous	307 06	
Total schedule K....		9,002 49
Elmira construction account, buildings and grading, L.......		38,417 78
		$64,170 36
By cash and securities on hand at this date............	$23,317 69	
Deduct loan at Exchange B'k,	6,000 00	
		17,317 69
		$81,488 05

We, the undersigned, do hereby certify that we have examined the foregoing accounts, and compared the same with the vouchers therewith presented, and find the same correct, and that all the payments have been accounted for; also that we have had exhibited to us the securities above mentioned, and the bank book, showing the balance of funds as stated.

ALBANY, *Jan.* 21, 1873.

ADIN THAYER, JR., } *Auditing*
JAMES GEDDES, } *Committee.*

MILO INGALSBE, *President.*
T. L. HARISON, *Secretary.*

On motion of Mr. Edwin Thorne, of Dutchess, the report was accepted.

Ex-President Conger presented the minute adopted by the Executive Committee upon the death of Ex-President George Vail, and the same was read, as follows:

MINUTE

Upon the death of Ex President George Vail, presented, by order of the Executive Committee, to the New York State Agricultural Society, at the Annual Meeting, January 22d, 1873, by Ex-President Abraham B. Conger.

The Executive Committee, with the deepest regret, enter upon their record the death of Mr. George Vail, an Ex-President of the Society, and who had survived all but one of his predecessors in that office

He died full of years and ripe in the esteem of his associates in this Board. His neighbours and fellow-citizens in an adjacent city have uniformly, and with great unanimity, added their testimony to that which the members and officers of this Society have rendered to the high probity of his life and the marked benevolence of his character. Of the Society of Friends, by birth he illustrated in other relations and in his life duties the noble sentiment taught him in his youth, of good will toward his fellow men.

Thirty-five years ago he turned aside from the busy routine of commercial pursuits to look, as he might find opportunity, after the culture of a farm purchased at that time. His enthusiasm, stimulated by his success in the cultivation of his crops, prompted his introduction into this State of the first Short Horns imported from the renowned herd of the late Thomas Bates. These animals attracted great attention and did much good, and naturally led to the subsequent importation of the choicest and most costly specimens of this tribe of cattle.

In the year 1847, Mr. Vail was elected President of this Society, and discharged the duties of that office with appropriate fidelity and dignity. His term of office, which gave the first fair of the Society to Saratoga, was marked by the singular and deeply lamented occurrence of sudden death to the orator selected to deliver the annual address, after its preparation and before its delivery. The orator was Silas Wright, so beloved and distinguished in all his relations in life, public and private, that his name ever bears fresh laurels. The oration was, by special request and the unanimous judgment of the Society in the choice of his substitute, read by the Honourable John A. Dix, who filled his chair in the United States Senate, and is his present successor in the gubernatorial honours of this State.

At the close of his Presidency, Mr. Vail served, as is our custom, for five years as an active member of the Executive Committee, and manifested his hearty interest in the welfare of our Society to the last.

Those have been pleasant recollections of the early days of this Society, when with Wadsworth, Beekman, King, Johnson, and others of the old régime, this veteran in our ranks joined, as his health permitted, in our annual meetings and autumnal gatherings, with his juniors in service and in years. And now that we shall see him no more, we rejoice to know that his useful and happy life terminated so serenely. He has been gathered to his fathers: his works of benevolent service are

the heritage of his family and of his cherished associates in beneficent enterprize.

On motion of Ex-President Geddes, it was

Resolved, That the New York State Agricultural Society has heard with deep regret of the death of Thomas Hall Failo, Ex-President, at Nice, France, on the 13th inst.

That, impressed with a sense of his valuable and earnest work for the Society, and of his eminent character, this Society will cause a suitable memorial to be prepared and published, and that Ex-President Conger be requested to perform this service.

On motion of Ex-President Conger, it was

Resolved, That a committee, to consist of three members from each judicial district, to be selected by the members present from the district, be appointed for the purpose of nominating officers for the ensuing year, and also, if they see fit, to recommend the place for holding the Annual Fair.

Whereupon, upon the nomination of the members present from the several districts, the Committee was appointed, and retired for deliberation, and returning, reported by their Chairman, the Hon. Abraham B. Conger, the following list of officers:

President,

BENJAMIN F. ANGEL, of Livingston.

Vice-Presidents.

1st district.......JOHN D. WING, of New York.
2d district.......EDWIN THORNE, of Dutchess.
3d district.......DANIEL DONCASTER, of Albany.
4th district......FRANK D. CURTIS, of Saratoga.
5th district......JAMES GEDDES, of Onondaga.
6th district......ALEXANDER S. DIVEN, of Chemung.
7th district......ROBERT J. SWAN, of Seneca.
8th district......WILLIAM H. PENDRY, of Orleans.

Corresponding Secretary—THOMAS L. HARISON, of St. Lawrence.

Recording Sec'y—WILLIAM H. BOGART, of Cayuga.

Treasurer—LUTHER H. TUCKER, of Albany.

Executive Committee—ADIN THAYER, Jr, of Rensselaer; HARRIS LEWIS, of Herkimer; JOSEPH JULIAND, of Chenango; WHEELER H. BRISTOL, of Tioga; WILLIAM M. HOLMES, of Washington; ISAAC H. COCKS, of Queens; JOHN MANLEY, of Cattaraugus; CHARLES D. MILLER, of Ontario.

And, a ballot being had, the officers so nominated were unanimously elected.

The committee further reported that they recommended Albany as the place for holding the Annual Cattle Show and Fair.

E. Lewis Sturtevant, M. D., of South Framingham, Mass., read a paper, entitled, The Claims of the Ayrshire Cow upon the Dairy Farmer, and thereupon the thanks of the Society were voted to Dr. Sturtevant for his interesting paper, and a copy was requested for publication in the Journal and Transactions.

X. A. Willard, Esq., of Little Falls, read a paper upon the production of milk, and on motion, the thanks of the Society were voted for the same, and a copy was requested for publication in the Journal and Transactions.

The Society then took a recess until half-past seven o'clock.

7½ P. M. The Society re-assembled at the Agricultural Hall.

The President delivered his annual address, and at the conclusion thereof introduced the newly elected President, Mr. Benjamin F. Angel, of Livingston, who assumed the chair.

On motion, it was

Resolved, That the thanks of the Society are tendered to Milo Ingalsbe, Esq., for his valuable services during the past year in the office of President, and also for his excellent address just delivered, and that he be requested to furnish a copy for publication.

Charles A. Goessman, Ph. D., Professor of Chemistry in the Massachusetts State Agricultural College, read a paper, entitled, "The Fertilization of Farm Lands, with Reference to Commercial Manures," and, on motion, the thanks of the Society were voted to Professor Goessman for his very able and instructive essay, and a copy was requested for publication in the Journal and Transactions.

The Secretary read a paper contributed by A. F. Liautard, M. D., President of the New York College of Veterinary Surgeons, on the recent epizootic influenza, and the results of his observations, as prepared for publication in the report of the Board of Health of the City of New York, and, on motion, the thanks of the Society were voted to Dr. Liautard for his contribution.

The Society then adjourned.

EXECUTIVE MEETING, NEW BOARD.

January 23, 1873.—Present, the President, Vice-Presidents Doncaster, Curtis and Geddes; the Secretaries; Messrs. Thayer and Juliand of the Executive Committee, and Ex-Presidents Patrick, Church and Ingalsbe.

On motion of Mr. Thayer, it was

Resolved, That the corresponding Secretary be designated as the acting Secretary of the society, with the same salary and allowance for clerk as last year, and that the salary of the Treasurer be the same as last year.

On motion of Vice-President Geddes, it was

Resolved, That Colonel H. Bowen be appointed General Superintendent, and that his compensation be ten dollars per day during and at the time of the fair, and five dollars per day at all other times when employed on business of the Society, his travelling and other expenses to be paid in all cases.

On motion of Ex-President Church, it was

Ordered, that a committee be appointed to examine into the expenses of the fairs, and to report whether and how the same can be reduced; and the President appointed as such committee Ex-President Church and Messrs. Thayer and Juliand.

On motion, it was

Ordered, that the memorial of Ex-President Kelly, prepared by General Patrick, be published in the Transactions, and that not exceeding 500 copies be printed in pamphlet form.

On motion, Ex-President Church, Vice-President Geddes and the corresponding Secretary were constituted a committee on the care and improvement of the Elmira fair grounds and buildings, with full power.

On motion, the President, Vice-President Wing and the Treasurer were appointed the Financial Committee.

On motion, it was

Resolved, That the Financial Committee be and are hereby authorized to sell such of the securities held by the society, either registered or otherwise, as they shall think proper.

On motion, it was

Resolved, That Luther H. Tucker, Treasurer, be and is hereby authorized and empowered to receive the interest upon the registered United States bonds held by the society, as the same shall from time to time become due.

On motion, it was

Ordered, That the President and Secretary receive the reports of the Judges at the winter exhibition, and revise the same, and that the Secretary thereupon pay the premiums awarded.

Adjourned.

EXECUTIVE MEETING.

February, 7, 1873.—Present, Mr. Thayer, of the Executive Committee; the Secretaries and Ex-President Ingalsbe.

Letters and excuses for non-attendance, were received from the President, Vice-Presidents Curtis, Geddes and Swan; Messrs. Juliand and Holmes, of the Executive Committee, and Ex-Presidents Patrick and Campbell.

The Secretary presented the report of the Committee appointed at the meeting of the Executive Committee, on the 4th day of October, 1872, in relation to the contract for the buildings and other work on the Elmira Fair grounds, as follows:

UTICA, *January* 29, 1873.

To the Executive Committee of the New York State Agricultural Society:

Your Committee met this day, and after looking over Mr. Walker's books and accounts, we have agreed to pay him five thousand dollars in settlement of his account, which amount he agrees to take.

Signed. S. CAMPBELL,
WILLIAM M. HOLMES,
ROBERT J. SWAN,
Committee.

Which report was accompanied by an undertaking, signed by Mr. Charl s C. B. Walker, to accept the sum of five thousand dollars in full of all claims against the Society.

Whereupon, on motion of the Corresponding Secretary, it was

Resolved, That the report of the Committee on the Elmira buildings be accepted, and the settlement of the claims of Mr. Charles C. B. Walker in relation to the work and erections at Elmira, proposed by the Committee and agreed to by Mr. Walker, be and is hereby approved and confirmed.

Resolved, That the Treasurer be and is hereby authorized and directed to pay the sum of five thousand dollars to Mr. Charles C. B. Walker, in full of all claims by him against the Society.

Adjourned.

PREMIUMS AWARDED AT WINTER MEETING, JANUARY 23, 1873.

APPLES.

10 varieties, first premium, George W. Bender, New Scotland....	$5
10 varieties, second premium, J. J. De Forest, Duanesburgh....	3
1 variety, first premium, J. J. De Forest, Duanesburgh, "King of Tompkins county"..	5
1 variety, second premium, G. W. Bender, New Scotland, "Northern Spy"........	Trans.

PEARS.

Collection of winter pears, first premium, Ellwanger & Barry, Rochester, 45 varieties*...	$10
Collection of winter pears, second premium, O. B. Gridley, Deansville, 10 varieties........	5
1 variety, first premium, O. B. Gridley, Deansville, "Lawrence"........	5

CHEMICAL COMMITTEE'S REPORT ON GUANOS.

To the Executive Committee of the New York State Agricultural Society:

The undersigned, having been appointed a Chemical Committee, under the resolution of the Executive Committee, passed May 4, 1872, and instructed to obtain samples of guanos sold at retail in the city of New York, and to have them analyzed by Mr. William M. Habirshaw, analyst to the chemical trade of that city, who had offered his services to the Society for this investigation, respectfully report:

That they caused to be purchased, of each of the dealers and firms named below, one bag of guano, at the dates and prices below stated, and numbered the same as below, the same numbers being referred to in the analyses given in this report.

1872.		
Aug. 6.	1—Robert C. Reeves, 185 and 187 Water St., 1 bag guano, 170 lbs.,	$6 37
Aug. 9.	2—E. H. Reeves & Co., 184 and 195 Water St., 185 lbs. guano......	6 94
Aug. 6.	3—Decatur & Coxe, 197 Water St., 179 lbs. guano, 3¾ cts..........	6 72
Aug. 9.	4—Geo. Ricardo, 195 Water St., 1 bag guano, 178, at 3¾..............	6 67
Aug. 6.	5—Vanderbilt Bros., 23 Fulton St., 1 Bg. Pu. guano, 162, 3¾........	6 07
Aug. 6.	6—John Moore, 193 Front St., 1 bag guano, 161..................	6 04
Aug. 6.	7—E. A. Reeves, 58 and 60 Courtlandt St, 1 bag No. 1 Peruvian guano, 197 lbs., at 4 cts......	7 88
July 23.	8—R. H. Allen & Co., 189 and 191 Water St., 1 bag guano, 170 lbs., at 4 cts..........................	6 80
July 26.	9—Chapman & Van Wyck, 170 Front St., 1 bag No. 1 Peruvian guanc, 168 lbs., at $75..............	6 30
Aug. 9.	10—Geo. E. White, 160 Front St., 1 bag No. 1 Peruvian Chincha, 180 lbs., at 4 cts..................	7 20

That these purchases were all made by Mr. Cocks, of your Committee, and shipped to his farm at Old Westbury, L. I., by railroad.

That for purposes of comparison your Committee obtained of Messrs. Hobson, Hurtado & Co., the agents of the Peruvian Government in New York City, a bag of Guanape guano, numbered 11, and of the Manhattan Manufacturing and Fertilizing Company a bag of their nitrogenized superphosphate, sold under the name of Phosphatic Blood Guano, numbered 12 in this report.

That the several bags so purchased were conveyed to the residence of Mr. Cocks as speedily and directly as possible, and there carefully sampled by your Committee, the samples put into sealed glass jars, and numbered I to XII (1 to 12) as above, and delivered to Mr. Habirshaw for analysis.

That on the 21st of October they received the report and analyses of the said twelve samples from Mr. Habirshaw, as follows:

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* The varieties included in this very fine collection, were the following:

Abbe Edouards.
Bezy Sansparell.
Baylor.
Beurre d'Aremberg.
" Gris d'Hiver.
Bergamot Royal d'Hiver.
Beurre Langlier.
" Millet.
Black Worcester.
Beurre Easter.
Columbia.
Doyenne Rose.
" du Cercle.
" d'Alencon.
" Sieulle.
" Goubault.
Dr. Capron.
Epine Dumas.
Easter Bergamot.
Grand Mogul.
Haddington.
Homewood (Gen Taylor).
Jones Seedling.
Josephine de Malines.
Hericart de Thury.
Leon le Clerc de Laval.
Louis Vilmorin.
La Quintinye.
Passe Crassane.
Prevost.
Poire de Herts.
Pound.
Rallay.
River's Thorny Beurre d'Aremberg.
St. Germain (Prince's).
St. Germain.
Sageret.
Souvenir d'Esperen.
Tarquin.
Therese Kumps.
Van Buren.
Vicar of Winkfield.
White's Seedling.
Willermoz.
Winter Nelis.

Analyses of Twelve Samples of Guanos, for N. Y. State Agricultural Society.

I—XI. PERUVIAN? GUANOS. XII. SUPER. PHOS.	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.
Moisture at 100° C. Direct determination	12.546	10.220	12.049	12.357	13.715	14.734	9.271	14.342	12.714	11.462	18.209	20.172
*Organic Matter and Ammoniacal salts	23.685	19.440	22.498	23.156	40.134	44.726	31.384	42.772	43.030	23.411	43.374	36.111
**Phosphates	10.983	9.496	13.451	13.264	18.648	20.806	14.978	13.579	13.963	12.358	22.248	15.685
***Alkaline Salts, etc., sol. in warm water at 160° F.	5.770	5.650	6.000	5.350	12.950	12.050	7.350	11.700	11.250	5.100	11.090	
Sand and Silica	39.037	46.764	35.691	35.504	2.929	1.973	29.792	10.827	17.639	37.184	1.506	1.863
Undetermined and loss	7.979	8.430	10.308	10.369	5.624	5.711	7.225	6.780	1.404	10.485	3.568	
	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	
*Containing Nitrogen	5.021	3.732	4.813	5.020	10.972	10.051	6.673	9.035	9.035	4.716	10.039	2.871
Equivalent to Ammonia	6.097	4.532	5.845	6.096	13.324	12.204	8.103	10.972	10.972	5.751	12.191	3.486
**Containing Insol. Phosphoric Acid	5.031	4.350	6.163	6.076	8.542	9.530	6.861	6.220	6.396	5.661	10.191	7.185
Equivalent to Bone Phosphate												
***Containing Sol. Phosphoric Acid	2.920	1.698	2.300	2.175	7.308	6.384	2.977	5.648	5.552	2.194	6.122	6.335
Equivalent to Bone Phosphate	6.374	3.707	5.021	4.748	15.954	13.934	6.499	12.330	12.120	4.789	13.364	13.830
Total Phosphoric Acid	7.951	6.048	8.463	8.251	15.850	15.914	9.838	11.868	11.948	7.855	16.313	13.520
Ash (in genuine Peruvian Guano=30 to 33 per cent)	63.754	70.340	65.453	64.487	40.151	40.450	59.345	42.886	44.256	65.127	38.412	43.717
Adulterations (Nos. VIII. and IX. inferior)	Sand.	Brick dust.	Brick dust.	Brick dust.	....	....	Sand.	....	....	Brick dust.		

Samples received per Long Island Express, Sept. 4, 1872. HABIRSHAW, *Analyst.*

For the purpose of showing how largely the several samples vary in value, we append the following results of a computation, in which it was assumed that the value of nitrogen is 17 cents in gold per pound, and of phosphoric acid 10 cents in gold per pound, and that no other constituents should be taken into account. The values were thus computed for each of the samples I to XI, per ton of 2000 pounds, and are (in gold) as follows:

No. of sample	I.	II.	III.	IV.	V.	VI.
Value	$32.97	24.78	33.28	33.56	69.00	65.99

No. of sample	VII.	VIII.	IX.	X.	XI.
Value	$42.35	54 44	54.60	31.74	66.75

We desire to be clearly understood that these results, as regards value, are given merely for the sake of enabling persons who may take an interest in the subject, to compare the results above given, and that it is not intended by your Committee to assert that the assumed standard or method of computation is correct; still less that the figures given represent the true or even the approximate value to the farmer of the several samples.

Your Committee further report that their expenses have been $75.30 for purchase of samples, and that their account for the same has been paid by the Treasurer. Also $8 travelling expenses of Mr. Gould, not yet paid.

ALBANY, *January* 21, 1873.

JOHN STANTON GOULD,
ISAAC H. COCKS,
Committee.

Since the publication of the foregoing report, a letter has been received from Col. M. C. Weld, of New York, connected with the firm of R. H. Allen & Co., and a letter has been addressed by that firm to the *Country Gentleman*, in which the guanos Nos. VIII and IX of the above report are stated to have been from the cargo of the "Andrew Johnson," and that this cargo was of poorer quality than usual with guano imported, as this was, direct from the Chincha Islands. In confirmation of this statement, and also to show that Mr. Habirshaw's analysis is confirmed by the subsequent analysis of Prof. C. F. Chandler, the following letter from the agents of the Peruvian Government is appended:

NEW YORK, *February* 24, 1873.

T. L. HARISON, ESQ., *Cor. Sec. New York State Agricultural Society, Albany, N. Y.*

Dear Sir: Mr. Weld has shown to us a letter he addressed to you, dated Feb. 20th, and asks us to confirm his statements in regard to the analysis of the cargo of the "Andrew Johnson" from the Chincha Islands, received last summer, and now sold.

After seeing the analysis of the guano obtained from Messrs. R. H. Allen & Co. and from Messrs. Chapman & Van Wyck, purporting to be pure Chincha Island guano, as sold by us from the cargo of the "Andrew Johnson," we were so much surprised at the result that we caused an analysis to be made by Prof. Chandler of the portion of the cargo then remaining, and he has confirmed the analysis made by your chemist, Mr. Habirshaw.

The quality of the Chincha guano has from the first been so uniform that we have had no analysis made of it, while we analyze each cargo of Guanape on arrival, and which is now so little inferior to the Chincha that farmers prefer it to the latter, at the lower price they pay for it.

We regret that we as well as the eminently fair-dealing and reliable firms from whom this guano was obtained, were thus deceived in this rare instance of the "Andrew Johnson's" cargo of Chincha guano not proving of standard quality. We believe Messrs. R. H. Allen & Co. and Messrs. Chapman & Van Wyck are among those who have sold only pure guano, as obtained from us; and from our long intercourse with them they have our full confidence, and are entitled to that also of those who deal with them in Peruvian guano, either Chincha or Guanape.

We have read the printed report made to your Society by the Committee appointed to report on "Guano, as sold in New York," and have to thank the New York State Agricultural Society for exposing therein the frauds practiced by the several parties professing to sell pure Peruvian guano.

We remain, etc.,
(Signed) HOBSON, HURTADO & CO.,
Consignees of the Peruvian guano.

ON THE FERTILIZATION OF FARM LANDS WITH REFERENCE TO COMMERCIAL FERTILIZERS.

BY CHARLES A. GOESSMANN, PH. D.,
Professor of Chemistry in the Massachusetts State Agricultural College.

One of the most important features in the present management of farms is the general and extensive use of the commercial, concentrated fertilizers. Their merits are so well established, that a rational, intensive system of farming is thought impracticable without their assistance—particularly when it is proposed to apply them in connection with barnyard manure and as a correction of its composition.

It is but thirty years ago that the mineral constituents of plants were still looked upon as being merely of incidental occurrence, and without any essential bearing on the development of the plants which contained them. Our views concerning this question have since completely changed. A few words may state the cause of that change. Numerous and more exact chemical analyses of the ashes of plants, which accumulated during the beginning of the present century, began by de-

grees to engage the attention of the scientific investigators. In comparing the ash constituents of the different plants, they soon noticed that certain mineral elements were present in a more or less conspicuous proportion in every plant. The general occurrence of these substances led subsequently to the quite natural assumption, that their presence might be necessary for the performance of some physiological process during the growth of the plant. Actual experiments, instituted under well defined circumstances, for the purpose of testing that view. proved quite conclusively that a certain kind and a certain amount of mineral elements are indispensable to the complete development of a plant through all its stages of life, and that in case its *own* ash-constituents are not supplied. the plant may come to blooming, yet it will not produce a perfect seed. To Professor Justus von Liebig. before all others, belongs the credit of pointing out these relations Even the use of guano was first urged by him, in 1840, on the strength of his analytical results, and its special virtues as a fertilizer argued at a time when not one pound of guano had been used on the farms of Europe. Alexander von Humboldt's report (1814) concerning the guano-beds upon the Chincha Islands, etc., and its use by the Peruvians, had passed by unnoticed. In citing this instance, I need not to mention that I am fully aware of the well-authenticated statements, that the manure of fowls was already highly valued some thousands years ago by the ancient Romans, and that wood ashes, gypsum, bones, lime, marl, and other mineral substances have been used more or less effectually in the agricultural industry previous to the period I referred to above; yet it will be conceded that their essential relations to plant-life, as we understand them to-day, was not known.

The successful introduction of the commercial mineral fertilizers for agricultural purposes, is one of the striking illustrations of the influence and the value which exact modes of inquiry with well-defined questions have over mere experimenting without a desirable previous correct appreciation of the agencies and the principles involved in the operation. The true progress in agriculture can, in almost every instance, be proved to be the result of the application of such rational modes of investigation as every branch of natural and physical science has sanctioned in its own field of inquiry. To begin with a careful analysis has proved to be. here as elsewhere in experimental sciences, the safest and most economical course to secure a desirable foundation for synthetical attempts. The recent improvements in the general farm management do not consist in the introduction of some particular new system; for, to keep up the fertility of the soil under cultivation, by fallow and the rotation of crops; to use irrigation and drainage; to enrich one portion of the farm lands at the expense of another, by keeping a certain proportion of meadows to secure manure for the grain lands;* or to fertilize the surface soil at the expense of the subsoil; or to raise deep-rooting plants, as the lupine, esparsette, lucerne, beet roots or red clover, etc., for feeding purposes and in the interest of fertilization,—are all time-honoured modes of operation of over more than a thousand years' standing. What we claim as the real progress consists in the more efficient use of their best features.

Their repeated, complete failures in former ages, were but a natural consequence of the state of information, and due to the want of suitable means to gain a deeper insight into their peculiar mode of action. The intelligent farmer of the present day has greatly improved his ch nces of success by calling on the scientific investigators in every department of natural and physical science to aid him in his varied and complicated field of operation. The best experimental resources of to-day have served as guides in drawing more correct deductions and finding thus more reliable means. To study the growth of our farm plants under simple and well known circumstances in the vegetation house and upon the experimental field, and to control the results thus obtained carefully in their various relations by means of the balance in the laboratory, has greatly improved our chances of arriving at a more rational interpretation of agricultural facts than when noticed under more or less complicated conditions in the usual course of farm operations. Leaving here the improvements of farm implements out of consideration, we can safely assert that the attainment of better results in agricultural operations is mainly due to a better knowledge regarding the relations of the life of the plants to the soil, to the air and to the water, and the various reactions of these three agencies upon each other, besides a due appreciation of the mutual dependence of the animal and the plant life in ordinary farm management. Modern, rational agriculture recognizes as its basis the necessity of a strict restitution to the soil of those substances which the crops have abstracted. To prove the existence of these relations, and to learn how to comply with their requirements, is the work of the scientific investigations of the present generation. There is no opposition to any particular system; each farmer is left to choose an agricultural industry best adapted to his natural and personal resources; yet all are restricted by one common rule—they have to comply with the unalterable relation which exists between demand and supply—for each plant, although in its own peculiar way, tends to exhaust the soil sooner or later.

The rapid and extensive introduction of the commercial mineral fertilizers is the best practical acknowledgment, although frequently unconsciously given, on the part of the practical farmer regarding his belief in the usefulness of a scientific inquiry in his domain. The use of these concentrated fertilizers has fairly revolutionized the agricultural industry. They have proved, whenever judiciously used, a most profitable investment. A new era may be dated from the time of their introduction, for the farmer finds his field of industry less restricted than formerly; he is more at liberty to choose his crops with reference to his markets, and farming tends thus to be more remunerative. Their importance cannot be over-estimated as long as farmers still allow a fair portion of their home fertilizers to waste, and as long as the sewage question of our centres of social life remains practically unsolved. The special character of many of these artificial manures favours, frequently, specific results of growth which renders them indispensable for the production of special crops for industrial purposes. They may therefore be used in the interest of the *quantity* and the *quality* of crops.

In the following pages I propose to present—

First.—A few ideas concerning the fertilization of farm lands with reference to the use of commercial fertilizers, and

Second.—A short description of the recently intro-

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* The relative proportion of phosphoric acid and potassa in the produce of meadow lands is one of the former to four of the latter. In that of grain producing lands, one to one in the case of wheat and one to two in the case of Indian corn. 2,000 pounds of hay (first and second crop) contain—

Nitrogen	26.2
Total ash	133.2
Potassa	34.2
Lime	15.4
Magnesia	6.6
Phosphoric acid	8.2
Sulphuric acid	6.8
Silicic acid	39.4

—[*Wolff.*]

duced Stassfurt potash and magnesia fertilizers, and their present reputation for agricultural purposes.

I. *The fertilization of farm lands with the aid of commercial special fertilizers.*

The barnyard manure is quite deservedly still the main fertilizer in ordinary farm operations; yet its peculiar value rests to-day more in its beneficial influence on the physical condition of the soil, than in its effect on the chemical composition of the latter.

Analyses of ordinary barnyard manure (1,000 *pounds*).

	Water.	Org. substance.	Ash (total).	Nitrogen.	Potassa.	Soda.	Lime.	Magnesia.	Phosphoric acid.	Sulphuric acid.	Silicic acid.	Chlorine.
Fresh	710	246	44.1	4.5	5.2	1.5	5.7	1.4	2.1	1.2	12.5	1.5
Half rotten.	750	192	58.0	5.0	6.3	1.9	7.0	1.8	2.6	1.6	16 8	1.9
Much rotted	790	145	65.0	5.8	5.0	1.3	8.8	1.8	3.0	1.3	17.0	1.6

Being better informed concerning the requirements of a complete manure, we know that barnyard manure—although one of the most complicated of our common fertilizers—can claim only in exceptional cases that title. Its composition depends mainly on the kind of food consumed and on the nature of the substance used for the absorption of the animal secretions; its first cost depends on the price of the farm produce turned to account for its production, and its commercial value varies widely in different localities. Wherever the farmer sells a portion of the productions of his industry without replacing their ash constituents—either in some suitable form of food for his live stock, or its equivalent in the form of some corresponding fertilizer—he cannot prevent his barnyard manure becoming, for his own system of farming, by degrees an inefficient fertilizer; for it will no longer contain all the elements in such a proportion as his crops, for a complete reproduction, require. A change in the fertilizer is equal to a change in the composition of the soil, particularly that portion of it which alone counts in the production of the next crop. This change may be but slight in one year, yet it will surely acquire serious proportions in the course of time. The present condition of numerous farms in this and other countries, furnishes a plain illustration of that fact. Meadow lands, fallow, rotation of crops, superior mechanical preparation of the soil, in fact, all those modes of treatment which aim at a timely development of the latent natural resources of the soil, can, even under the most favourable condition, only more or less delay the time of its agricultural exhaustion; they cannot prevent that ultimate result. To count, in case of intensive farming to any extent, on an efficient supply of mineral plant food, by means of the disintegration of the soil, has proved to be one of the most uncertain factors for farm calculations.

The concentrated commercial fertilizers furnish an excellent means of correcting the composition of the barnyard manure obtained under any system of farming, and of thus making it a complete fertilizer for the crops under cultivation. The kind of fertilizer a farmer ought to buy is best learned from the composition of the articles he sells;* he ought, therefore, to make himself somewhat acquainted with their general character. There is no safer guide than the chemical analysis of the crops produced, by which the question shall be decided, of restoring to the soil what the crops have absorbed. It is quite customary, upon large farms in Europe, to keep a book account concerning the kind and the amount of plant food abstracted from the lands under cultivation, and its subsequent movements. The rational manager of a farm considers the ready plant food the capital he has to put on interest; on its fair return depends his pecuniary success. The beneficial results produced by a liberal use of commercial fertilizers in support of barnyard manure, are best illustrated by the large crops so frequently obtained in England, and elsewhere in Europe, where that practice widely prevails.

I here call attention to an observation quite generally made in former ages, as well as in our time, namely, that in cultivating the grain crops with the exclusive assistance of barnyard manure, first the yield of grain declined, and then that of the straw; and in case of high manuring, that the yield of the straw increased and the grain declined until finally the whole crop agriculturally failed. The wheat crop first showed these features, and the remaining crops are more or less tending in the same direction. This peculiar result has found its explanation in the influence which the universal practice of selling the grain crops has on the soil turned to account for their production. Careful examinations of the seeds of all our cereals have revealed the fact that these seeds contain an unusual proportion of phosphoric acid, as compared with the straw:

Wheat grain,	0.82 parts phosphoric acid.
Wheat straw,	0.28 "
Indian corn grain,	0.55 "
Indian corn stalks and leaves,	0.38 "

In selling the grain, from two-thirds to four-fifths of the phosphoric acid abstracted from the soil is lost for the next crop, and so year after year. Considering, at the same time, that this acid is but slowly rendered soluble by natural agencies, the final results cannot be doubtful. Continued consumption, without an adequate restitution, directly or indirectly, means exhaustion of that compound, even in the most favoured localities. The straw found still, for some time, its sufficient sup-

* One thousand pounds of air-dry mass contains—(*Wolf.*)

	Nitrogen.	Total ash.	Potassa.	Soda.	Lime.	Magnesia.	Phosphoric acid.	Sulphuric acid.	Silicic acid.
Wheat grain	20.8	17.7	5.5	0.6	0.6	2.2	8.2	0.4	0.3
Rye grain	17.6	17.3	5.4	0.3	0.5	1.9	8.2	0.4	0.3
Barley grain	15.2	21.8	4.8	0.6	0.5	1.8	7.2	0.5	5.9
Oats grain	19.2	26.4	4.2	1.0	1.0	1.8	5.5	0.4	12.3
Indian corn (grain) ...	16.0	12 3	3.3	0.2	0.3	1.8	5.5	0.1	0.3
Peas	35.8	24.2	9.8	0.9	1.2	1.9	8.8	0 8	0.2
Beans	40.8	29.6	12.0	0.2	1.5	2.0	11 6	1.5	0.4
Potatoes	3.2	9.4	5.6	0.1	0.2	0.4	1.8	0.6	0.2
Common beet-roots...	1.8	8.0	4.3	1.2	0.4	0.4	0.8	0.3	0.2
Turnips	1.8	7.5	3.0	0.8	0.8	0.3	1.0	1.1	0 2
Hay	13.1	66.6	17.1	4.7	7.7	3.3	4.1	3.4	3.4
Live calf	25.0	38.0	2.0	0.6	16.3	0.5	13.8	....	0.1
Live ox	26.0	46.6	1.7	1 4	20.8	0.6	18.6	....	0.1
Live sheep	22.4	31.7	1.5	1.4	13.2	0.4	12.3	....	0.2
Live pig	20.0	21.6	1.8	0.2	9.2	0 4	8.8	....	....
Wool (washed)	94.4	10.3	1.9	0.3	2.5	0 6	0.3	....	0.3
Milk	6.4	7.0	1.7	0.7	1.5	0.2	1.9	0.1	....
Cheese	45.3	67.4	2 5	26.6	6.9	0.3	11.5	....	....
Eggs	21.8	84.8	1.6	1.5	43.3	0.3	3.2	0.1	....

ply of phosphoric acid, yet left but little over for the formation of grain. The general condition of farm lands, regarding their present reduced store of active phosphoric acid, alone accounts for the rapid and universal endorsement of the phosphatic fertilizers, as bones, super-phosphates, etc., for it is contrary to the teachings of recent exact experimental inquiry to ascribe to phosphoric acid a particular virtue over any other *essential* article of plant food, as potassa, lime, magnesia, sulphuric acid, carbonic acid, water, and some suitable nitrogen compound. Our information concerning the requirements of *soil constituents* for a full development of plants, has of late become more precise. It is believed that the previously mentioned substances are not only essential but of equal importance—which means that in case one of them is wanting, as a general rule the rest cannot act. The exact position of other substances, as iron, silicium, chlorine, manganese, etc., which are frequently found in plants, is still less defined; their functions, in case they have any in the vegetable economy, are less conspicuous, and future investigations will settle these questions. The frequent observations in practice, that of two crops which require the same essential soil constituents for their growth, one still yields satisfactorily while the other one has failed, does not contradict the previous statement. A close examination in all these instances will show that these crops either live upon quite different strata of soil, or their roots are by nature more or less capable of absorbing the available plant food; they have either more fine rootlets, or they spread over a larger surface, for the absorption of plant food by the roots depends on the surface which they present to the soil. We find it quite natural, therefore, that conditions may exist where potatoes prosper and beet-roots fail, or where oats give abundant returns and wheat does not pay, although in both instances a similar amount of most essential articles of mineral plant food is required. The examination of the construction and the extension of the roots of the farm plants has given most valuable suggestions in regard to advantageous systems of rotation of crops.

The peculiar *agricultural* value of any fertilizer depends on the condition of the lands under treatment; and *that one* of its constituents exerts the highest effect which increases the amount of that ingredient which is most wanting in the soil for the growth of the plants under cultivation. In some instances it may be a suitable nitrogen compound; in others, phosphoric acid, or potassa, or lime, etc. The *agricultural value* of a fertilizer, and its *commercial value*, are measured by quite different standards. The former depends on the judicious selection of the farmer; the latter on the relation of demand and supply in the general market. The amount and the relative proportion of the active plant food in the soil control the yield of the crops, provided weather and climate are equal. To secure the highest possible yield under given circumstances requires to manure to such a degree that the plants find, at any given period in their growth, the largest amount of *each* article of plant food they are capable of turning to account. It is a noticeable fact that plants frequently require, even of one and the same article of plant food, a different quantity within the various stages of their growth. The grain crops, for instance, consume a remarkably large proportion of nitrogen during the period of blooming and forming seed. In case the supply is not adequate to the periodical demands of the plant, the yield of the crop will suffer. This is the reason why a liberal manuring on rational principles pays best.

The present views regarding the supply of *atmospheric plant-food* are not less explicit than those regarding the ash-constituents of plants. There is good reason to assume that all the carbon and the nitrogen, which plants and animals contain, are of atmospheric origin. Perfect plants may be grown from seeds in previously calcined soil—after all organic and nitrogenous matter has been destroyed—by adding the ash-constituents of the plants, and by keeping the whole moist with rain water. The nitrogen required for the new plant is furnished by the rain water in the forms of ammonia and nitric acid. The atmosphere contains for ordinary requirements—particularly for perennial plants—an ample store of carbonic acid, water and ammonia. Unmanured meadows and forests* testify in that direction; yet, when *the time* required for growth becomes an important factor—as in the case of growing farm crops—it is but natural to conclude that an artificial supply of atmospheric plant-food deserves the same attention as the supply of mineral plant-food; for any excess of the latter is of no use, if a proper complement of the former does not render it active. To cause a luxuriant growth requires, therefore, an artificial supply of atmospheric plant-food; and as decaying organic substances are continually producing every form of it, we understand at once why an efficient incorporation of organic matter in the soil has a beneficial influence on the yield of the crops. The roots absorb the carbonic acid and the ammonia or nitric acid in the soil. This additional source of atmospheric plant-food becomes of great importance, when the leaves of the plants are but little developed, or where they are by natural limitation but small, and thus in both instances less qualified for a liberal absorption from the air. Decaying organic substances act also beneficially on the physical condition of the soil; they are a source of heat in consequence of their gradual combustion. As a liberal source of carbonic acid, they aid in the disintegration of the soil, and on account of their highly carbonaceous character in their advanced state of decay, they render a light soil more retentive. When properly incorporated into heavy soil, they counteract its retentiveness by their own shrinking. Notwithstanding all these beneficial chemical and physical reactions of the organic matter on the soil, no controlling importance is any longer accorded to its presence; for, without the corresponding quantity of the mineral constituents of the plant, its influence on the yield of the crop can be but slight. The humus theory has had its day, and the nitrogen theory has followed suit. Each fertilizing substance has its own limit in advancing growth; an accumulation of any of them in the soil is, to say the least, bad economy, if not directly hurtful. The fact that phosphatic fertilizers sometimes, after years of liberal use, do not produce the large crops which were obtained when they were first applied, is a natural consequence of supplying fertilizers without a due regard to the demand.

From the previous remarks it will appear quite conclusively that the special commercial fertilizers deserve the attention of the farmer, on account of their peculiar fitness to make the barnyard manure a complete fertilizer for any crop, and to produce thus the highest yield which the lands under cultivation are capable of. The commercial artificial fertilizers favour, also, on account of their concentration and their solubility, a speedy enriching of the soil. To restore farm lands, which have been reduced in productiveness, to their original fertility, even when possible, by means of barnyard manure, requires usually years of high manuring. The quality of the animal secretions and the properties of the soil to be enriched have each their specific influence on the final result. Manure obtained from horses or high-fed

* Hlubeck states the annual average growth of wood in the forests of Austria to be 1500 pounds (equal 32–33 cubic feet) per Prussian morgen; or 2700 pounds upon one acre.

animals disintegrates more rapidly than that from cattle. Heavy and compact soil, being usually more retentive, requires a larger amount of plant-food, to be thoroughly fertilized, than a less retentive one. Light soils, as sandy loam, etc., are known to show sooner the signs of manuring than heavy soils; they are also more easily exhausted. A mild loamy soil pays the best returns with concentrated commercial fertilizers; and extremes of soils are considered, from an economical standpoint, but little fit for intensive farming. As the farmer has to deal more or less with all kinds of soil in a varying state of productiveness, he cannot but find himself often surrounded by serious difficulties when attempting to bring his lands to their highest yield, if depending exclusively on barnyard manure; for the latter requires several years for disintegration. A properly selected commercial mineral fertilizer will. in such cases, in a much shorter time, impart to the soil what is wanting; its rapid distribution will turn at once the latent and inactive plant-food of the soil to better account. and thereby secure, even in the first year, a remunerative return. To increase the annual yield of the crop does not require large quantities of commercial fertilizers; comparatively speaking, small quantities in a state fit for immediate assimilation are frequently sufficient; from twelve to fifteen pounds of nitrogen, and twenty to twenty-five pounds of phosphoric acid per acre are known to favour, in an unusual degree, the annual yield. As speedy action is a most desirable property of commercial fertilizers, it is but proper that the farmer should insist upon their preparation with reference to that important point. All ought to be brought in a state of minute division by chemical or mechanical means, as the circumstances may prescribe. Their comparative high price renders it most desirable that the investment should be soon returned with interest. Many of these artificial manures have of late acquired, also, an additional value on account of their special character, and by their specific reaction on the growth of important industrial crops they have greatly aided in developing their valuable properties. The results thus far obtained with the tobacco plant and the sugar beet are very encouraging. Their value will increase in the same degree as the exact functions of the various essential mineral plant-constituents become better understood. The study of their peculiar influence on the production of the organic plant-constituents, as starch. sugar, fat, etc., has already for years engaged the attention of agricultural chemists.

The recognition of the importance of certain mineral and other substances in the economy of plant life has produced, as a natural consequence, the trade in fertilizers. Each demand found soon its suitable supply. Gypsum, guano, bone phosphates and super phosphates, frequently mixed with nitrogenous animal matter, or with ammonia compounds, or with Chili saltpetre, have formed with us heretofore the main bulk of commercial fertilizers. Lime, phosphoric acid, sulphuric acid and nitrogen have thus been for years duly represented in the market. Magnesia had no representation, and potassa received but little attention; for its two main former sources, wood ashes and nitre, had either become inadequate to the demand, or were considered too expensive for agricultural purposes. The recent discovery of a large deposit of potassa and magnesia compounds in Germany has caused a renewed interest in extensive and systematic trials regarding their agricultural value. The present state of these inquiries I propose to describe briefly within a few succeeding pages.

II. *On Stassfurt Potash and Magnesia Fertilizers.*

In a paper read before the Massachusetts State Board of Agriculture, December, 1869, I alluded to the growing importance of the Stassfurt dungsalt. Numerous experiments made by qualified parties in Germany, France and England, leave at present no doubt about their great value as fertilizers. They have of late also been introduced into our markets, and as they are supplying a special want among our commercial manures, they seem to be destined to acquire a considerable importance with us, particularly as far as some special commercial crops are concerned.

The source of these salines was first discovered at Stassfurt, in Prussia, in connection with an extensive rock salt deposit—hence their name, Stassfurt fertilizers. In passing a shaft down to a depth of 1,066 feet, a peculiar layer of various saline compounds, of 158 feet thickness, was penetrated, which overlaid the rock salt. This surface mass seemed to contain all the more soluble saline compounds, but slightly altered, of the oceanic waters from which they originated. As a source of common salt for domestic purposes it had no value, and was therefore (for it had to be removed to get at the underlying rock salt) thrown aside as worthless. The celebrated analytical chemist Heinrich Rose subsequently called attention to this saline refuse mass as a fit source of potassa compounds. The Prussian government acted (in 1860) on his suggestion, and caused sales at low rates, offering at the same time premiums to those parties who should succeed in inventing some suitable mode by which it might be turned into more valuable compounds for industrial purposes. The present extensive industry at Stassfurt is the result of that movement. The production of potassa amounted in 1867 already to twenty-four million pounds, and the entire capacity of the mines, as far as explored, has been stated to be equal to from 100 to 120 million pounds per year for one hundred years to come. The influence of this new source on the general market may be inferred from the fact that in 1868 the entire annual supply of potassa compounds for all industrial purposes consisted of eight million pounds of potassium chloride, 40.2 million pounds of potassium nitrate, and 65.2 million pounds of potassium carbonate—in all 113.6 million pounds.*

Agriculturists were among the first to avail themselves of the cheap, *crude* refuse salines for fertilizing purposes, yet they met with but little success in their experiments. The following statement may convey some idea of the composition of the crude Stassfurt dungsalt, which had been used in many of the earlier experiments (Heiden):

Magnesium chloride,	from	12.2	to 31.19	per cent.
Sodium chloride,	from	2.69	to 57.20	"
Potassium chloride,	from	0.0	to 14.49	"
Potassium sulphate,	from	2.0	to 19.21	"
Sodium sulphate,	from	1.9	to 17.21	"
Calcium sulphate,	from	0.0	to 19.10	"
Calcium carbonate,	from	0.0	to 4.40	"
Magnesium borate,	from	0.0	to 4.01	"

The differences shown in its composition were mainly due to the fact that the various saline compounds are found in the mine in successive layers, more or less isolated from each other; the quality of the fertilizer thus depending entirely on the circumstances under which it had been obtained.† This varying composition rendered it quite obvious how little reliance could be

* The potassium carbonate was obtained from the following sources:

18.2 million pounds from Russia.
10.3 " Hungary.
13.5 " North America.
23.2 " refuse material in the beet sugar manufacture of Europe.

† See detailed description of occurrence in my paper on Stassfurt Potash Fertilizers, *American Chemist* (New York), July, 1871, page 5.

placed in its efficiency. The farmers consequently discontinued its use, and thereby, it seems, compelled the parties interested in its sale to produce a more reliable material. There is at present scarcely a Stassfurt fertilizer in the market which is not the result of some artificial process of concentration. They are sold in Europe with a specific analytical statement of their composition, and with a guaranteed percentage of potassium oxide. The amount of potassium oxide. and the form in which the latter is present, controls their commercial value. A recent price list of one of the largest manufacturing companies at Stassfurt may serve as an illustration concerning the kinds of fertilizers which are to-day offered for sale, and their respective market price. The cost refers to gold (one Prussian thaler equals 72.04 cents, gold), and applies to quantities of 50 kilo, or 100 pounds. For larger quantities, reduced prices are customary:

	Per cent. of potassium oxide.	
1. Potash fertilizer, ground, containing 16 to 22 per cent. potassium sulphate........................	9 to 11	$0 36
(From 320 to 800 pounds per acre.)		
2. Concentrated potash fertilizer......	25	1 26
(From 240 to 480 pounds per acre.)		
3. Potash-magnesia sulphate, or artificial kainite, containing 28 to 30 per cent. of potassium sulphate.......	15 to 18	60
(From 320 to 640 pounds per acre.)		
4. Potash-magnesia sulphate, containing 52 to 56 per cent of potassium sulphate, and 30 to 38 per cent. of magnesia sulphate..............	28 to 30	2 64
5. Concentrated potash sulphate, containing 78 to 80 per cent.........	43 to 44	3 36
(From 160 to 210 pounds per acre.)		
6. Concentrated chloride of potassium (muriate of potassa).............	50 to 53	2 64
(From 160 to 210 pounds per acre.)		
7. Sulphate of magnesia (kieserite), containing 60 per cent. of magnesium sulphate		36

These figures teach us that the potassium oxide costs less in the lower grades than in the higher ones; and that in combination with chlorine it costs less than in combination with sulphuric acid. The greater cheapness of the lower grades ceases as soon as 100 pounds of potassium oxides costs more freight than 60 cents gold. The freight from Stassfurt to Bremen or Hamburg, for a quantity not less than five tons, is stated to be, for every 100 pounds (5¼ sgr.), 12.6 cents gold; the freight by sailing vessel per ton to New York city, etc., amounts to about three dollars.

The commercial kainite has thus far been mainly imported. It contains, in its *calcined* state, from 15 to 18 per ct. of potassium oxide; the ton of 2,000 pounds has been offered at $20 currency on board of vessel at New York city.

The discouraging results at first obtained with the crude Stassfurt dungsalt had greatly reduced its consumption, as stated; yet they did not prevent a continuation of experiments under more favourable conditions, and by parties who duly appreciated the importance of securing a cheap and efficient source of potash for agricultural purposes. The question which the rational agriculturist and the agricultural chemist proposed to themselves, was no longer whether potash compounds would benefit the crops; for there is scarcely a customary system of rotation of crops, supported by barnyard manure, on record, in which the drain of potassa did not exceed that of any other mineral or soil constituent. Only extensive stock fattening can alter that result. Minerals containing potassa were known to yield but slowly to the ordinary agencies of disintegration, and many kinds of soil had proved to be deficient in it. Dr. Birnbaum, in calculating the average removal of the soil constituents in the case of fourteen different systems of rotation of crops, with proper proportion of live stock and ordinary sales of grain and milk, found that every acre under cultivation requires an additional supply of 17.4 pounds of potassa, 6.4 pounds of magnesia. 11.0 pounds of lime, and 14.2 pounds of phosphoric acid. Some of the industrial farm crops, as hops, potatoes, beet-roots, tobacco, corn, etc., are known to abstract an unusual quantity of potassa from the soil. A few additional average figures will convey some more definite ideas regarding its consumption:

Grain crops, abstract per acre about..........	23.7	pounds.
Meadows and pastures, growth	56.88	"
Most garden vegetables and hoed crops	111.60	"
Clover and other foddering crops	63.20	"
Commercial plants............................	79.0	"
Grape cultivation	63.2	"

Cordel states that the sugar beet in Austria abstracts annually from the soil 17.3 million pounds of potassa; in France, about twice that amount; in Germany, 38.9 million pounds. The potatoes in old Prussia, even without leaves and stems, take not less than 84.0 million pounds of potassa from the lands they grow on. Taking the utmost economy for granted, there is scarcely more reason to doubt the beneficial effects of potash compounds upon our farm lands, than that of phosphoric acid or of some suitable nitrogen compounds. Numerous experiments manifestly confirm the fact that our cultivated lands are quite frequently in such a peculiar state of exhaustion, that an addition of phosphoric acid and potash produces larger crops than either of them alone, and that potash, phosphoric acid and some suitable nitrogen compound will be still more efficient than any two of them alone.

The main point, therefore, which required more exact investigation was, to find out by experiment, in what form does potassa act best—as far as its occurrence at Stassfurt is concerned—namely, as chloride or as sulphate. The results thus far obtained endorse the potassium sulphate as the safest of the two combinations, except upon wet lands, where the potassium chloride has proved to be preferable. The potassium sulphate acts also very beneficially regarding the *quality* of certain commercial crops. Stöckhardt noticed a decided increase in the percentage of starch in the potatoes; Stohman and Karmrodt increased the percentage of sugar in the sugar beets; and Schlössing and Nessler found that it counteracted in tobacco the tendency to charring, producing, therefore, a material in a superior degree fit for smoking purposes. The potassium chloride has not received that general endorsement, as far as these commercial crops are concerned; its use in case of potatoes and tobacco is directly opposed, for its influence is more decisive in regard to quantity than to quality. It is, on the other hand, highly recommended for meadows and pastures, for all kinds of forage crops and grain crops—in the latter case, particularly when applied in connection with super-phosphates. It is decidedly preferred on wet lands and on very retentive heavy clayey soils.

The efficiency of a potash fertilizer, as with all other fertilizing substances, can only be noticed in those instances where the soil is really deficient in potash compounds, and where they find a liberal access to the roots of the plants under cultivation. Some kinds of soil retain the potassa within the first few inches of their surface layer; others pass it freely to the subsoil. A disregard of the influence of the condition of the soil on the distribution of a plant food like potassa, has caused, no doubt, a great many failures. The distribution of a plant food ought to be carried out with ref-

erence to the crops we propose to cultivate; the stratum of the soil, upon which the crop feeds, ought to be fertilized, if we wish to derive an immediate benefit from our manures.

Thompson and Way, as is well known, first noticed the fact that soil, as a general rule, absorbed from percolating solutions, in an unusual degree, the ammonia, the phosphoric acid and the potassa. As long as mechanical treatments, like ploughing and harrowing, were considered the only efficient means by which these substances could be distributed for fertilizing purposes, but little confidence was felt that deep-rooting plants, like clover or sugar beet-roots, could be economically benefited by the potash compounds found at Stassfurt. More recent investigations have changed that view. We have learned some of the causes which control the entire phenomena of absorption, and are acquainted with substances which aid in the distribution of potash fertilizers throughout the entire soil-mass upon which farm crops feed. We know, at present, that the property of the soil to absorb ammonia, phosphoric acid and potassa, depends almost entirely on the presence of a certain amount of a fine clayey silt and a well-diffused humus mass. As both conditions of a soil are the natural results of a rational system of cultivation, we can understand why potash fertilizers may have given sometimes better results upon well-cultivated, yet more exhausted soil, than upon a new-broken ground It has also been illustrated by experiments, that the absorption of potassa can only take place in a soil which allows an exchange with lime, magnesia and soda. Where these compounds are absent in a soil, or present only in small quantities, or in a state unfit for an exchange, there the absorption remains doubtful, and the action of the fertilizer uncertain. The important service which practical farming has derived from these and similar scientific investigations, consists in the discovery and introduction of chemical means to aid in the desirable diffusion of mineral plant food throughout the entire soil-mass. Liebig noticed that common salt, Chili saltpetre, ammonia compounds and decaying organic substancess, being a source of carbonic acid, promoted the distribution of phosphoric acid. Frank and Pincus noticed the same effect on potassa by adding common salt and magnesium sulphate to the soil. The presence of the latter in the German potash compounds adds much to their efficiency for the fertilization of deep-rooting plants.

The element magnesium occurs in two forms in the Stassfurt salines—as chloride and sulphate. The magnesium chloride has shown itself very injurious to plant growth; it acts destructively on the roots. Its presence in any fertilizer is therefore objectionable. The lower grades of these manures, which usually contain a larger proportion of it, are therefore calcined before being sent into the market. The magnesium sulphate in the presence of potassa and soda has no serious effect on plants. It favours, more than any other compound, the distribution of the potassa throughout the soil.

The Stassfurt fertilizer No. 4, consisting of 52 to 56 per cent. of potassium sulphate, and 30 to 38 per cent. of magnesium sulphate, enjoys a particular reputation as the most efficient compound to cure clover-sick and beet-sick farm lands; its potassa passes soon to the lower strata of soil, upon which these plants feed. The chemist who noticed this behaviour calls it the chemical plough, which digs four feet deep. This effect is generally recognized. Magnesium sulphate acts also as an absorber of phosphoric acid and ammonia, and in this respect is superior to gypsum when scattered over barnyard manure. To add magnesium sulphate to our fertilizer is but judicious, for magnesium is one of the essential mineral substances which every plant requires for its growth. The seeds of our cereals contain twice and three times as much magnesia as lime. Its supply should therefore not be left to mere chance.* The saline character of all Stassfurt fertilizers renders certain precautions necessary for their use. They injure the roots of the plants when brought in direct contact. The safest and best way to apply them in ordinary farm operations is to scatter daily a certain amount over the fresh barnyard manure, or to incorporate them into compost soil. In case they are to be used as special fertilizers for the production of commercial crops, as tobacco, sugar-beets, hops, etc., they ought to be mixed with three to four times their weight of soil containing humus, and subsequently ploughed under to a desirable depth. The autumn is the best time for their application, except in case of a loose, gravelly or sandy soil, where spring manuring as a general rule pays best. Their systematical, continued use is recommendable only upon well-tilled lands, or upon lands with a permeable subsoil.

* One acre of beet-root leaves contains from 84 to 85 pounds of magnesium oxide.

THE CLAIMS OF THE AYRSHIRE COW UPON THE DAIRY FARMER.

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In the eighteenth century, but little more than a hundred years ago, there was a county in Scotland, of which we have descriptions pitiable in the extreme—of roads hardly practicable, of farm houses merely hovels, plastered with clay, with the fireplace in the middle. The dunghill at the door of the wretched home represented the farm buildings; and the cattle were so starved in winter as scarcely to be able to rise without aid in the spring. Scarcely any crop but oats following a scanty crop of oats, until a fallow was required. The small field near the buildings received all the manure, and the outfields were entirely neglected and without enclosure, used in common. Famines, as might be expected, were frequent, and we are told of hundreds of families being obliged to fly for subsistence to the north of Ireland; and that in these seasons of misery the poor people were obliged to subsist by bleeding their cattle and mixing the blood so obtained with such scanty oat meal as they could procure. The markets were poor, the public credit was ill established, and manufactures had scarcely a foothold.

The soil of the county is mostly clay. The climate, the most humid of Scotland, encouraged the growth of moss, and at this time a large portion of the land must have been waste; for in 1866, notwithstanding the present industry and wealth of the inhabitants, and the presence of the proverbial Scotch shrewdness in a large degree, more than one-half of the county was occupied by hills, moors, mosses and lochs. This moisture was, however, favourable to the growth of grasses and herbage, although it rendered the tillage of the soil and the harvesting of crops rather precarious on heavy lands.

This was the county of Ayrshire in 1750 and 1760, as described by Fullarton, writing in 1798. Such were the surroundings from which were evolved the Ayrshire breed of cattle, the dairy race of the world.

Although this breed is usually written of as a mixed race, yet the larger portion of their ancestry must have been derived from the native cattle of the county at this time, and however affected afterwards by the introduction of improved animals from other places, yet must the Ayrshire cow be considered as the product of her environment. It will be in place, then, to refer briefly to the ancient cattle of the district. The first mention of the cattle of this region is by Ortelius, I

think, who writes in 1578 that in Carrick are oxen of large size, whose flesh is tender and sweet and juicy. "Sunt in Carricta regione ingentis magnitudinis boves, quorum caro tenera suavisq: esui est; ceterum pingue nunquam concrescit, sed olei liquidi instar semper fluens." (Abrahamus Ortelius. Theatrum Orbis Terrarum. Antwerp, 1578.) Aiton, writing in 1825, describes the older breed, from his recollection, as having been a puny, unshapely race, not superior to those yet to be met with in many of the higher districts. (Low's Animals, p. 842.) In the survey of Ayrshire, published in 1811, he describes them as being of a black colour. That this breed had a certain uniformity we may infer from the invention of provincial terms to describe the location of the colours. Thus, a dark cow with a white face was termed a "bassened" cow; one with much white on her neck was termed a "hawked" cow; when a strip of white ran along the ridge of her back, she got the name of a "rigged" cow; and if the lower part of her tail was white, she was said to be "tagged."

We can also infer the existence of animals sufficiently well defined to form a distinct variety, from the probabilities of the case, for Galloway on the south and the Highlands on the north preserve a native race. The very misery of the county would also incline us to believe that there was a native breed, for it is only as we find intelligence directed toward the improvement of a breed that we find diversity of product. Wild animals have a certain uniformity because they are let alone, and soon become in harmony with nature. Domesticated animals vary because they are exposed to variable conditions, and although they become in harmony with their position, that position has not the uniformity of natural conditions. It is intelligence which brings into a district, and breeds from, stranger cattle, superior to the natives, and by a strange perversion of judgment this manifestation of a desire to improve, or the spirit of the time, is overlooked by the majority of writers, and the credit of the improvement of a breed is given to the few animals of a foreign breed which may have been introduced. We thus find Aiton recording the importation, in 1750, of several cows and a bull of the Teeswater breed, of the high brown and white colour so general in Ayrshire in 1810, and he gives a few instances of distribution from this stock. He also gives a hearsay account of some cows, which are conjectured to be of the Dutch, Teeswater or Lincoln breed, being brought into the district by John Dunlop, of Dunlop; and also the introduction of some stranger cows, in 1769, by John Orr, of Barrowsfield, and thinks that there were probably other importations. As Aiton is willing to quote hearsay, and shows a great acquaintance with the county, it may be inferred that *he*, at least, had no further knowledge of even doubtful importations than he adduces. I will call attention to the fact that he records the introduction of but *one* bull—the rest were cows. We must give Aiton the justice of being a good observer, and of giving the credit of the formation of this breed of Ayrshire not to foreign blood alone, but to "selection, cross-coupling, feeding and treatment."

A Mr Home, in remarks before an Agricultural Club in England, in 1867 (Gard. Chron. and Ag. Gaz., July 27, 1867), says that "others had introduced cows from the Channel Islands, from all which, combined with West Highland blood, the present improved breed of Ayrshires had arisen." This idea was probably derived from the unknown writer of the "Complete Grazier," of which the third edition was printed in 1808. It is there said (p. vii.) "that the Dunlop breed is the produce of a cross of Alderney cows with Fifeshire bulls. * * * The horns of this race are small and awkwardly set. The animals are small in size, and of a pied or sandy red color. They are, however, admirably well calculated for the dairy, on account of the richness and quantity of the milk afforded by the cows." Is not this probably another account of the Dunlop importation, where we have the Alderneys credited with the improvement rather than the "Dutch, Teeswater or Lincolns," as stated by Aiton. For corroborative evidence we have it stated by Colonel Le Couteur that Field-Marshal Conway, the Governor of Jersey, and Lieutenant-General Andrew Gordon who succeeded him, both sent, about the close of the eighteenth century, some of the best cattle to England and Scotland.* (Jour. R. A. S., 1844, p. 47.) And Quayle, who wrote the Agricultural Survey of Jersey, states that the Ayrshire was a cross between the Short-horned breed and the Alderney. (Quoted in Jour. R. A. S., 1844, p. 47.)

We thus see that there is great uncertainty about the early history of these crosses. In Fifeshire there is a tradition that 300 English cows were received there by James IV. of Scotland, as a marriage dowry, with Margaret, the daughter of Henry VII of England. (1501.) This seems plausible, from this district being the country seat of royalty, and the customs of the times. Yet the introduction of this large number of cattle, if true, has not produced uniformity among the native cattle, for they are described by Low in 1842, as having but little uniformity, yet are spoken of as being good milkers.

Crossing, therefore, of itself, could have had but little influence in forming the Ayrshire breed in its earlier stages, for we have in our records but one statement of the introduction of a foreign bull, and another of the crossing of stranger cows with stranger bulls—the Alderney and the Fifeshire. The introduction of improved beasts, as an index of an advance in public opinion, and the improving tendency of the time, is of importance, for it fixes rather definitely the commencement of the improved breed. But in estimating the influence of a cross, remember that unless great skill is exercised, and care in procuring at frequent intervals fresh blood, the animals which are few in number are quickly absorbed in the preponderating race, and produce but little effect, except stimulating variability, and thus acting as an assistant in the art of selection. Where a foreign bull is used, in the tenth generation there will be but 1-1024 part of foreign blood in the offspring; and Gärtner found that with plants one species could be made to absorb another in from three to five generations, and he believes this could always be effected in from six to seven generations. (Darwin's Animals and Plants under Domestication. N. Y., 1868. Vol. 2, p. 112.)

It was selection, aided probably by crossing, and environment, which formed and fixed the Ayrshire breed, and it is unphilosophical to credit the breed with having obtained its excellence from any other distinct race. After its distinctive types were recognized, we find records of crosses with other animals by way of experiment. The Kyloe or West Highland cross brought in the woolly hair, upturned flattish horn, and hardy habits of the Swinley variety, highly valued at the show-yard, and differing in minor details from the prevalent race. The famous prize-taking bull "Geordie" was said to have one-eighth of the Highland cross. (Gard Chron. and Ag Gaz., July 27, 1867.) As to Short-horn crosses we find diversity of statement. Archibald Sturrock, writing in 1866, says, that so far as he is aware, the only Short-horn bulls in Ayrshire, are the one at Balsaggart, about eleven miles from Girvan, another at Woodlands, near Girvan, and a third lately brought into the

* I suspect, however, that this exportation was consigned to Banffshire.

county by J. N Fleming, of Kilkerran House, Maybole. (Pr. Essays High. Soc. 1866-7, p. 87.) Mr. Hope, of Fenton Barns, a Short-horn advocate by the way, says that half Ayrshire and half Short-horn is the cross generally preferred in the east of Scotland (not in Ayrshire, notice,) for milch cows. (Jour. R. A. S. 2d. Ser. vol. vii, p. 174.) Prof. Norton, in a letter dated 1844, says, "every large farm that I visited had a full blood Short-horn bull" (Farmers Library, vol. 3, p. 306); but he states that these crosses were raised expressly for fattening. Mr. Coleman, of Woburn, England, says that the first cross of Ayrshire with the Short-horn improved its value as a grazing, and also as a dairy breed, but that the cross if again put to a pure blood Short-horn, was a worthless mongrel. (Gard. Chron. and Ag. Gaz., April 12, 1862.) In 1869, when my brother and myself spent several weeks visiting the farms of Ayrshire, we saw but one Short-horn bull, and found that the Alderney, whether cow or bull, was so far unknown, as to be an object of curiosity even in the mention.

In the short limits of an address, I am unable to expand the early history as I should like, but I think I have shown that the Ayrshire cow is the creation of intelligence, and as such is eminently adapted to the use of the dairyman. Her appearance was between 1750 and 1800, coeval with the improving of roads and the advancing of Agriculture. The Earl of Eglinton commenced improvements about the year 1730. His agent, Mr. Fairly, introduced the Fairly rotation, and as the leases expired, this rotation which required that but one-third of the land should yearly be under the plough, was carried upon all the farms. Up to the year 1785, wheat was seldom to be seen beyond the limits of a nobleman's farm (Gazeteer of Scotland, 1., 90.) The improvement of the lands caused by improved culture, called for increased rents. As the poorer and more indolent farmers were driven out, the proprietors had a choice of tenants, and while the most active and industrious were preferred, this very circumstance operated as an incitement to others to become more industrious, and every advance of rent called forth a greater stretch of invention, and served as a stimulus to industry. So Aiton wrote in 1811. Yet there is evidence of other causes at work fully as important and more direct in their action, which I shall have to pass over for lack of time.

As the clay soil was in excess, and liable to be poached if worked under the almost continuous dripping of their moist climate, and as both climate and soil were suited to raising grass and herbage, great attention was paid to the dairy. The better milker was retained, while the poorer was rejected, and those shapes which experience showed to exist in the better cows, were sought for in the younger cattle, and aimed at in the coupling; for the shrewd Scotch farmer quickly learned that like produced like, at least in practice. Thus the Ayrshire was being builded up. Thus she took on the shape of a complete dairy animal. From the circumstances of her surroundings she became eminently fitted by the gradual process of adaptation to uses, and selection, to fill her place in Ayrshire husbandry. A perfect fill-pail, her udder became developed in capacity and shape. No bottle udder here to fatigue and distress the cow in the pasture. Her hair became soft and woolly, a protection from the climate. Her fore-quarters light, her hind-quarters heavy, for the Scotchman had discovered that a cow milked by her mouth and through her throat, and sought digestive capacity. Each advance must have been gradual, and every step must have been fixed as it was gained. Her type is the type to be sought for by dairy farmers, and retains its fixity in America as well as in Scotland.

Of seven writers who describe the marks of a dairy cow, irrespective of breed, the number who speak of the various parts are given, and their opinion of the value:

Head	should be	small, say 6; no mention by 1.
Eye	"	placid, say 7.
Neck	"	long and tapering, say 6; no mention by 1.
Shoulders	"	narrow at top, say 4; no mention by 3.
Chest	"	deep, say 4; far from narrow, say 2; narrow, 1.
Back	"	straight, say 4; depressed behind shoulders, 1; no mention by 2.
Hips	"	broad, say 5; no mention by 2.
Pelvis	"	capacious, say 4; no mention by 3.
Thighs	"	thin, say 5; no mention by 2.
Ribs	"	arched, say 5; no mention by 2.
Legs	"	short, delicate and fine, say 4;
Udder	"	large, say 7.
"	"	shrink after milking, say 5; no mention by 2.
"	"	well forward, say 4; no mention by 3.
Teats	"	moderate size, say 4; long, say 1; no mention by 2.
"	"	wide apart, say 4; no mention by 3.
Hair	"	soft, woolly, 4; no mention 3.

If we compare these points with those of an Ayrshire cow given by the N. Y. Ag. Soc., we find a correspondence in every particular but that of the neck, which is classed medium for the Ayrshire. Can a breed be faulty at the pail with such evidence in its favor? We thus see how successfully the Ayrshire tenant farmer worked out the problem of high rents to be paid from the produce of his cow.

If we collate the points of six noted dairy breed, the Fifeshire as described by Magne; the Yorkshire, which is the milking unimproved Short-horn, by Haxton; the Jersey by Allen; the Suffolk by Kirby; the Brittany by Gamgee; and the Ayrshire by Aiton; we find that the preponderance of points where mentioned, are as follows:

Head, long,	Thighs, flat and thin.
Muzzle, fine,	Ribs, arched.
Throat, clear,	Pelvis, roomy.
Neck, slender,	Belly, large.
Shoulders, thin,	Legs, small and short.
Chest, deep,	Udder, large.
Brisket, small,	" square.
Back, straight,	" well formed.

Here, also, we find the Ayrshire cow having all the marks of a dairy breed, and if we place any value on external shape as indicating internal function, we are bound to give the preference to this breed. So let any farmer, if he place any dependence on his judgment of form, if he lay any stress upon the shapes of an animal, let such a farmer examine carefully into the merits of the Ayrshire, before purchasing; for I hope to show before I get through, that such is clearly his duty.

I am not here to decry the Short-horn, for I believe in the noble massy beast I believe when grazing is the object, the Short-horn will claim the preference over any other breed. The promise of this breed, however, is to lay on fat; they are bred for this purpose, and the irresistible, unmeasured force of inheritance all tends towards this function. Why expect to raise good milkers here? Why seek indications of good milking families? Why seek the ancient records of Short-horn achievements at the pail, when inheritance of fat was weaker than at present, on account of being nearer the source of the improved breed, to prove the value of the animal for milk? This is simply a question

of fact, to be decided by scale or measure at the present day. Short-horn milkers are found both among thoroughbreds and grades, but so far as I have observed, the same uncertainty attends the production of good milkers among fashionable strains of Short-horns as among the mongrels misnamed natives. It is the Short-horn cow which departs from the type of the improved Short-horn, which is the better milker. When we hear the fact of a Short-horn of a fashionable strain giving much milk, it is so heralded as to show that in this case at least, an exception goes to prove the rule. I shall refer to this subject again further on.

The Ayrshire is bred and has been bred for milk: her inheritance is all in the line of milk-producing. Her form indicates it; her records prove it. When aged and dry, the same functions which ordinarily fill the udder, fill her muscles with fat; but while milking, inheritance, intensified yearly by selection, turns the energies of her system towards extracting material from her food, and secreting the larger and richer part in the udder. As the Short-horn stands with the grazier who has tried their quality, so does the Ayrshire stand with the dairyman.

By seeking improved breeds, the farmer is adding materially to the profits of his farm, for he is utilizing the great power and unerring certainty of inheritance. To make the benefits of an established breed more evident, I will proceed to examine into the state of the dairy, in some of its aspects, in New York and New England, and to draw certain conclusions therefrom.

The census of New York State, for 1865, returns for the average yield of the cows of the State, 75.5 lbs. of butter, 68.2 lbs. of cheese, and 27 gallons of milk per cow. Let us estimate the milk per cow which these returns indicate:

The Leyden Cheese Factory Association, in the New York State Ag. Soc. Trans. for 1865, report 9⅓ lbs. of milk to the pound of green cheese, and 9¼ lbs. of milk to the pound of cured cheese. Seven factories in Massachusetts, in 1868, report from 9.29 lbs. to 10.4 lbs. of milk to the pound of cheese. We can therefore safely assume 9¼ lbs. of milk to represent a pound of cheese.

From the Agriculture of Massachusetts (1865, p. 231) we find, from 74 experiments made by nineteen different parties, in June and September, that it takes, on an average, 20 90-100 lbs. of milk for one pound of butter, or in round numbers, 21 lbs. The cows used were what are termed natives, except in one or two instances, which were high grade and thoroughbred Ayrshires. Johnston gives as the average of good cows in England from 18 to 21 lbs. Prof. Wilson (Jour. R. A. S., 2d Ser., IV, 320) gives the amount required by different breeds in England, at from 16 to 20 lbs. Nine German writers estimate the amount all the way from 20 to 30 lbs. It will be reasonable, from these data, to estimate each pound of butter as representing 25 lbs. of milk.

Again: In the Report of the Department of Agriculture, for 1863, I find the following statement of the amount of butter and cheese made in four days by the factory system, in Orange county, N. Y.:

April 27. 1746 qts. milk, cream churned sweet, gave 115 lbs. butter. 239 lbs. cheese.

May 26. 3300 qts. milk, cream churned sweet, gave 210 lbs. butter. 550 lbs. cheese.

Oct. 19. 1700 qts milk, cream churned sour, gave 120 lbs. butter, 280 lbs. cheese.

Oct. 20. 1776 qts. milk, cream churned sweet, gave 115 lbs. butter, 236 lbs. cheese. Or 8522 wine quarts of milk made 560 pounds butter and 1305 lbs. cheese.

I shall assume that when cheese is made with the butter, the milk is not allowed to stand quite as long, nor is skimmed quite as closely, as when only butter is made. With this idea, it will certainly be correct to take Dr. Voelcker's analysis of *skim cheese* as a guide.

In the Transactions R. A. S. of England (XXII, 48, XXIII, 177), we find seven analyses of skim milk cheese. The average amount of butter therein is 22.48 per cent., the extremes 30.8 and 9.97 per cent. Assuming that the poorest of these cheeses represents only the butter which could not have been saved by the churn, we have the difference of 12¼ per cent., which, on an average computation, must have been taken from the butter product to add to the cheese, or about 20 per cent., if we suppose this skim milk cheese to be of the best quality.

Adding, therefore, to the 560 lbs. of butter, 163 lbs. or 271¾ lbs., according to the supposition that we make, we have the proportions for either case = 1 : 25½ lbs., and = 1 : 22.2 lbs.

Applying these results to the returns given by the census, we have, for the average yield of New York State, 2769 lbs., or 1276 quarts of 2.17 lbs. per quart, to the cow.

Upon examining the returns by counties, we find that Dutchess county represents the maximum milk farming, St. Lawrence county the butter, and Herkimer county the cheese production.

Dutchess county produced per cow—

$$\left.\begin{array}{r} \text{67.8 lbs. butter ......} \\ \text{.5 lbs. cheese ......} \\ \text{448 gals. milk ......} \end{array}\right\} = \begin{array}{l} \text{5588 lbs. milk,} \\ \text{or 2575 qts.} \end{array}$$

St. Lawrence county produced per cow—

$$\left.\begin{array}{r} \text{83 lbs. butter ......} \\ 41\tfrac{3}{4}\text{ lbs. cheese ......} \\ \text{2 gals. milk ......} \end{array}\right\} = \begin{array}{l} \text{2517 lbs. milk,} \\ \text{or 1160 qts.} \end{array}$$

Herkimer county produced per cow—

$$\left.\begin{array}{r} \text{21 lbs. butter ......} \\ 805\tfrac{1}{2}\text{ lbs. cheese ......} \\ \tfrac{1}{4}\text{ gal. milk ......} \end{array}\right\} = \begin{array}{l} \text{8432 lbs. milk,} \\ \text{or 1581 qts.} \end{array}$$

It may be said that these results of the census cannot be correct. To my mind, if anything, they are too large, for farmers generally overestimate the yield of their cows; for with a majority the number of quarts given is a matter of estimate rather than of measure or weight. Judging of the correctness by Dutchess county, I should say that the returns are too large to be a probable average.

Let us test the matter by further statistics. The census for 1850, 1855 and 1860 gives for Onondaga county the following averages: 1373 qts., 1216 qts., and 1288 qts. Average, 1292 qts. per cow.

Copying the statements of the yield of some of the best of your New York dairies, from your Transactions, I find that eight farmers, owning in the aggregate 357 cows in milk, report a yield of cheese from 375 to 518¼ lbs. per cow, or if expressed in butter, from 160 to 200 lbs. per cow.

Reducing these values to milk, as before, we have:

Yield per cow, by cheese estimate, 1641 qts. to 2269 qts.

Yield per cow, by butter estimate, 1843 qts. to 2304 qts.

Or an average of the eight returns, of 1881 qts. (of 2.17 lbs.) to the cow.

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THE JOURNAL

OF

The New-York State Agricultural Society.

VOL. XXIII.] ALBANY, MARCH AND APRIL, 1873. [NOS. 3 & 4.

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State Agricultural Rooms.

The Office of the Society is in the Agricultural Hall, corner of State and Lodge streets, Albany; and all communications on business of the Society should be so addressed.

ANNUAL MEETING.

Pursuant to amendment of the Constitution adopted at the Annual Meeting of 1872, the Annual Meeting will hereafter be held on the Wednesday succeeding the third Tuesday of January in each year, at the city of Albany.

Annual Meeting of 1874, January 21st.

New-York State Agricultural Society.

REPORT OF MR. GOULD ON CONNEL AND STURGEON'S GRINDING MACHINE FOR HARVESTER KNIVES.

On examining the grinding machine for harvester knives made by Messrs. Connel & Sturgeon, Newark, O., and exhibited by them at the fair of the New York State Agricultural Society, at Elmira, in 1872, I found that the grinding action was performed by a pair of emery cones, placed base to base on a horizontal shaft, which was made to revolve by the action of a crank through multiplying wheels of spur gearing, so that the cones made fourteen revolutions to one of the crank. The bevel of the cones was adjusted to give the exact taper required for the teeth of the cutting sections. The shaft of the emery cones was hung on joints which were perfectly flexible, so that they could be applied to the edges of the sections with great facility. The weight of the machine was 14 lbs., and the price $10. The emery cones are sold for 87½ cents, one of them will last for years in keeping a machine in order, and when worn out can be easily replaced. A set of very dull sections was made perfectly sharp in my presence in five minutes.

I have never met with any machine for this purpose that performed its work so well or so rapidly as this does, and I therefore very cordially commend it to the farmers of New York and elsewhere, who need an implement of this kind. The moving parts of the machine will last for a life-time without repairs if ordinary care is taken.

JOHN STANTON GOULD.

HUDSON, *March* 21, 1873.

REPORT ON P. K. DEDERICK'S PERPETUAL BALING HAY PRESS.

At the annual meeting Mr. Dederick exhibited a model of his new Perpetual Baling Hay Press, and a number of the members of the Society, upon his invitation, visited his factory, and witnessed the working of the machine. The machine consists of two timbers (sills) set on edge, and fastened strongly to each other by planks above and below, at a distance apart about equal to the width of a bale of hay; at one end of the frame thus formed is a cam wheel, to the axle of which a lever is attached which is turned by one horse. The revolution of the cam moves a horizontal toggle-joint lever which has sufficient motion to carry its plunger forward the length of the box (with a hopper on top) at the other end of the frame. The hay pitched into the hopper falls into the box, and at each motion of the plunger is pushed into the bale-box or mould, which is one-half longer or more than an ordinary bale, and is placed at the end of the frame and hopper-box, and strongly attached, and is of course open at each end, its sides being formed of four scantling (leaving three horizontal openings), and its top and bottom fastened at the outer end, but merely held down and up by springs at the end next the hopper. In working, a plank follower is first placed in the bale-box. This follower is made with three slots horizontally formed across it on each side, at the same distance apart as the openings in the sides of the bale-box. The pitcher then begins to pitch the hay into the hopper, and at each turn of the lever a boxful or large forkful is forced, pushing the follower and previous forkfuls before, it into the bale-box. By an ingenious arrangement connected with the spring top and bottom of the bale-box, the ragged portion of each forkful is folded down and up at top and bottom, and held until the next movement of the plunger brings more hay against

it, and secures it from turning back again. As soon as a sufficiently long bale has thus been pressed into the box, another follower is put in, and the operation proceeds without even a momentary interruption. When the second follower can be seen through the openings in the side of the bale-box, a wire tie is passed through each of the slots in the followers (corresponding to the openings in the sides of the bale-box,) brought round and fastened not especially tight, because the elasticity of the bale, when relieved from the pressure, brings them up taut. The second bale is all the while being gradually formed and pushing out the first one, and so the operation goes on, if necessary, hour after hour, without stopping except to change horses, and baling hay about as fast as it can ordinarily be pitched into the hopper.

The bales are very true and neat in shape, and tied only with the wire ties, no wood being used, unless preferred because cheaper. They ordinarily weigh from 300 to 400 pounds, from 44 to 46 inches long, and 23 inches by 28 inches on the ends, so that ten tons of hay baled by this press may be packed in a common box car.

The following is the report of the Committee:

The undersigned, viewing Committee at the Winter Meeting of the New York State Agricultural Society, visited by request the Albany Agricultural and Machine Works, and inspected in operation a newly invented hay press, patented by P. K. Dederick, a perpetual baling press, and we do not hesitate to say we deem it a great improvement on the former process. It avoids tramping the hay, substituting horse power for man power in this most laborious part of the work in the old method, and also avoids loss of time in wiring, taking out and adjusting the levers for a new bale, which ordinarily takes several minutes, and we are of the opinion that by using two strong horses, one at a time, and alternating frequently, one-third more can be accomplished by this new invention; and furthermore, we think the new machine can be so arranged as to be more easily moved from place to place, and put in operation, than the machine now in general use.

All of which is respectfully submitted.

WM. M. HOLMES,
R. W. PRATT.

ALBANY, *April* 7, 1873.

THE LATE LUTHER TUCKER.

It seems very proper to place before the members of the Society in the columns of their JOURNAL, the sketches of the life of this most useful and estimable labourer in the cause of agriculture, which, prepared with care and fitness, both of manner and matter, appeared in the *Country Gentleman* immediately after his lamented death; for Mr. Tucker was not only the father of the American Agricultural Press, but had equal right to the title of Father of our Society. Modest, industrious, patient, and of sound judgment, he devised the plan by which an agricultural journal was in this country first made successful in its aims and self-sustaining as a business enterprise. He designed it to be not only the medium by which facts and experiences of practical men should be made available to the farmers of the country, but a constant stimulus to intelligence and improvement for all its readers and contributors. The plan once formed was steadily adhered to, and its wisdom is not only proved by the esteem in which Mr. Tucker was personally held by the agriculturists of the nation, and by the popularity of the journals which he founded, but will be attested by the grateful minds of thousands who have through them been led to *think* and to instruct themselves.

THE CLAIMS OF THE AYRSHIRE COW UPON THE DAIRY FARMER.*

BY E. LEWIS STURTEVANT, M.D., OF SOUTH FRAMINGHAM, MASSACHUSETTS.

The Hon. Zadock Pratt, of your State, who has the reputation of being a skilled farmer, reports in your Transactions and elsewhere, an average yield during the six years from 1857 to 1862 inclusive, 2358 qts. per cow. For the seven years including 1863, 2124 qts. per cow. (U. S. Pat. Of. Rep. 1861, p. 416; U. S. Dept. Ag. Rep. 1865, p. 457.)

These, be it noticed, with but one exception, are the statements of premium yields. I add one premium yield of native cows, given for a dairy of nine cows, in the Agriculture of Massachusetts. The owner was a milkman in the vicinity of Boston, whose rule has been "to keep a good cow, when he got her, and if he has a poor one, to fit her for the butcher." In the nine months from January to October, the yield was almost 1914 qts. per cow. If we add to this yield the September figures, multiplied by three for the remaining months of the year, we have for the total of the herd, under exceptionally favourable circumstances, 2800 qts., wine measure, per cow.

In 1864, 425 factories in New York, with 128,528 cows, made 32,663,014 lbs. cheese, at the average of 9.11 lbs. milk to a pound of cheese. That is an average of 1066 qts. of milk per cow.

In 1864, 25 factories, with 12,180 cows, made 3,720,-399 lbs. cheese. Average per cow, 308 lbs. cheese. At 9.86 lbs. milk to the pound of cheese, as stated, this equals 1400 quarts of milk per cow. (Ag. of Mass. 1865. p. 231.)

Cheese factories are usually located in excellent dairy regions, where there is enterprise, and a larger yield than the average; yet these figures do not give the whole yield of the cows, as some, perhaps much milk, does not get to the factory.

Thus far, I have drawn deductions by assuming a value for the butter and cheese. I shall now proceed to give some facts from the dairy of Sturtevant Bros., Waushakum farm, South Framingham, Mass. I am not now giving you the results of guess work, but that of knowledge. For six years and over, we have had the custom of weighing the milk from each cow, morning and night, and I have kept the daily record in books prepared for that purpose, marking therein the feed, and whatever circumstances affecting the herd that may have occurred. Our herd was almost entirely natives for the first three years, and with the exceptions of a few head for a few months, Ayrshire during the last three years. We thus have excellent data for comparison. Our year commences with January.

In 1865 we purchased a farm near a thriving village, which would supply a market for our milk. Our farm was in an exhausted state, and as manure was selling at eight dollars a cord in our vicinity, we decided upon overstocking our land, and by purchasing hay and grain bring the farm into productiveness. We therefore purchased the best native cows that we could, going for them into the rural districts where a few dollars in advance of the ruling rates would purchase the selection from a farmer's herd. In addition to this we had out a standing offer of one hundred dollars for any cow who would milk twenty quarts a day in our presence, and we repeatedly purchased cows under that claim. We fed high, hoping to get our return from milk, fat and manure. I go into these details in order that you may see that we tried to get the best native cows that could be procured, and fed well, and if our judgment was

* The first part of this paper was printed in the JOURNAL for January and February.

reasonably correct, in giving the statistics of this herd, we are giving the statistics of as good a herd of native cows as New England can supply. But whether so or not, we have in this herd a basis for comparison with our Ayrshires on similar terms.

	Av. No. cows.	Average yield per cow.
In 1867......	35.7	4,687 lbs., or 2,160 qts.
In 1868......	36.3	4,837 lbs., or 2,229 qts.
In 1869......	27.4	4,015 lbs , or 1,850 qts.

Average for the three years, 33.1 cows; average yield per cow, 2,079 qts.

During this time we fed on the average to each cow, each year, 351 lbs. shorts, 90 lbs. linseed meal, 150 lbs. rice meal, 879½ lbs. corn meal, 188 lbs. cotton seed meal, 8 lbs. oat meal—at a cost of over $30 per cow.

I will say here that cows that will give 20 quarts a day are rare in New England. We hear of them very often; each farmer claims his share. But unfortunately, when put to the test of measure, some exceptional circumstance is the excuse of the owner for the cow not fulfilling his promise. Yet cows that will give 20 quarts for a few days are found, but those which will continue this flow for any length of time are extremely scarce. If any farmer thinks he has such, let him measure her milk for a few days before he speaks of it. The heaviest milker we have had during these three years of natives gave for one year 3,703 qts., but the next year she only gave 1,659 qts The heaviest milker for the three consecutive years gave 2,963 qts., 2.952 qts., and 2,098 qts.—average, 2,672 qts. Never did we obtain 40 lbs. a day but with one cow during these three years, and she gave 42½ lbs. once, 42 lbs. once, 41 lbs. twice, 40½ lbs once, and 40 lbs. eight times. It will be remembered that 42½ lbs. is but 19¾ quarts. I am not now stating what can or cannot be produced by any one in *his* herd; I only give the records of our herd.

In 1869, after having tested a few Ayrshires in our barn, we crossed the ocean in order to examine improved dairy breeds in their own homes, and if we found them of sufficient merit, to bring over to our farm the best we could obtain. After viewing carefully the stock among the best farmers in Ayrshire, we were thoroughly convinced of the value of this breed for our husbandry; and not only did the best specimens of cows show value, but the high average quality of those we met with on each farm gave us a most favourable opinion of their worth. We therefore imported a lot, which arrived in December, 1869, and these few, with others purchased in this country, comprise the herd whose statistics I am about to give you.

	Av. No. cows.	Average yield per cow.
In 1870......	19.8	5.678 lbs., or 2.616 qts.
In 1871......	18.7	4,990 lbs., or 2,300 qts.
In 1872......	13.3	6,221 lbs., or 2,866 qts.

Average number of Ayrshire cows for three years, 17.2; average yield, 2,594 qts.

During these three years we averaged 2.5 bulls and 8 young stock per year, for now we had a breeding herd. By bulls I mean animals in service, and by young stock I refer to animals not calves of the present year, and not yet in milk or use. I think it will be fair in estimating the feed to call 2 bulls and 3 head of young stock to require the feed of a cow.

During these three years we carried to the barn* on an average each year per cow, shorts, 412 lbs.; corn meal, 1,088 lbs.; linseed meal, 98.2 lbs.; cotton seed meal, 107.6 lbs.; malt screenings, 85.6 lbs. This represents a value of $27.50 per cow, at the same valuation as in the former case.

I would call attention here to the fact that 1870 and 1871 were years of continued, severe and exceptional drought.

The largest yield in any one of these three years from the Ayrshires was 3,961 quarts. The next year the same cow gave 3,288 quarts. The largest average of the same cow for three consecutive years was 3,160 quarts.

During this time we had among the Ayrshires 67 yields of 40 lbs. and over, as follows:

11 yields of	40 lbs.	20 yields of	41 lbs.
9 "	42 lbs.	9 "	43 lbs.
6 "	44 lbs.	3 "	45 lbs.
2 "	46 lbs.	5 "	47 lbs.
1 "	50 lbs.	1 "	51 lbs.

Again, selecting six cows each year from the number kept during the whole year, and such represent the best milkers, we have—

In 1867, 25 native cows, the 6 best, gave 2.919 qts.
In 1868, 25 " " 3,047 qts.
In 1869, 16 " " 2,562 qts.

Average of 22 cows to select from; the 6 best in the average of 3 years, 2,842 qts.

In 1870, 13 Ayrshire cows, the 6 best, gave 3,169 qts.
In 1871, 14 " " 2,747 qts.
In 1872 13 " " 3,186 qts.

Average 13.3 cows to select from; the 6 best in the average of 3 years, 3,034 qts.

As a matter of fact in obtaining these results we selected from 35 different native cows and 17 different Ayrshire cows.

It will also be instructive to compare the records of the same natives kept during three years with the Ayrshires under similar circumstances.

Of the 8 native cows retained through three years, from a high opinion of their worth, I present the following figures:

	No. 1.	No. 2.	No. 3.	No. 4.
1867.............	6,416	5.524	3.796	5,408
1868.............	4,554	4,601	4 846	4,079
1869.............	6.481	4,140	3,112	3,790
Average lbs....	5,800	4.755	3,918	4,425
Average qts...	2,673	2,191	1.805	2,039

	No. 5.	No. 6.	No. 7.	No. 8.
1867.............	5,735	1,735	5.866	1,780
1868.............	4,192	7.055	4,457	3,087
1869.............	4.750	5,144	4,577	3,601
Average lbs....	4,892	4,644	4,966	4,489
Average qts...	2,254	2,140	2,288	2,045

Or an average of 2,179 qts. yearly.

Of the 10 Ayrshires retained through three years, we have—

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
1870...........	5,912	6,264	7,176	3,086	6,848
1871...........	5,429	5,050	5,854	3,639	6,172
1872...........	7.298	5,656	5,636	4,213	6,571
Average lbs...	6,214	5,656	6,222	3,646	6,080
Average qts...	2,823	2,606	2,867	1,680	2,779

* It is our practice to have the grain checked when it leaves the granary, which is a distant building. As several colts usually receive more or less grain, and as waste occurs more or less in other ways, it is evident that more grain is credited to the cattle than is actually consumed. However, I prefer to reckon in the way that I have, as it is better to err in this way than to use guess work. We usually fatten a few steers each year, whose account should have been kept separate. I however prefer to let the hearer make his own allowances, as I prefer that he rather than I should do the guess work.

	No. 6.	No. 7.	No. 8.	No. 9.	No. 10.
1870	6,805	6,578	6,220	8,596	5,740
1871	5,147	5,730	5,149	7,135	5,067
1872	6,299	5,675	6,525	4,846	5,532
Average lbs...	5,917	5,994	5,964	6,859	5,446
Average qts...	2,726	2,762	2,748	3,160	2,508

Or an average of 2,666 qts.

These tables show conclusively that the best cow in the barn one year is not necessarily so the next, and that a farmer can give his average yield for *one* year, and not necessarily give the *milking average*, or average profit of the dairy on his farm.

From the data which I have given, I shall state as probable :

That the average yield of dairies in New York State is .... 1800 qts.
That the average yield of the best dairies in the State is .... 1800 qts.
That the possible average yield of best native dairies is.............................. 2300 qts.
That under circumstances that will allow the best selected and culled native cattle to produce .... 2080 qts., a good Ayrshire breeding herd will produce 2590 qts.

To strengthen the Ayrshire statement, I would refer to the record of E. T. Miles, of Fitchburg, who publishes a very clear and apparently correct statement of the yield of his whole herd, averaging 9.3 head for three years. This average is 5614 lbs., or 2587 qts. per cow per year.

I will call your attention to the difference between the terms of these statements—a common difference of 500 quarts. This I shall assume represents the common ratio between the three classes of average—average best, and possible yields. I will therefore represent the facts in a new form :

	CLASS 1. Possible av.	CLASS 2. Av. of best dairies.	CLASS 3. Com. av.
Natives........	2300 qts.	1800 qts.	1800 qts.
Ayrshires......	3000 qts.	2500 qts.	2000 qts.

Here is a common difference of 700 quarts in each class, and if my reasoning is correct, this sum will represent the breed difference of the Ayrshires and the so-called natives in New England and New York. According to this view, and you will observe the facts are strong in its favour, the dairyman who forms a herd of Ayrshires of relatively the same grade of value as the natives which he discards, is by this act increasing his milk product by 700 quarts per cow. If he is one of your indolent, careless farmers, that help reduce the average yield of your State, who, under the recognition of self-interest, introduces the Ayrshire breed to his farm, he is almost doubling his annual returns. If an average farmer, he is increasing his yield from 1800 quarts to 2000 quarts per cow; and if of the best, most wide-awake character, he is having it in his power to increase his yield from 1800 to 2500 quarts.

This same reasoning will apply in great measure to the intelligent use of Ayrshire bulls. When the owners of grades will give the statistics of their herds, in like manner it will be easy to deduce the influence of the foreign mixture. Although a single cross, in a large district, is soon absorbed into the prevailing breed, producing but little permanent change, yet the *constant* use of superior bulls of one breed will gradually change the dairy capabilities of a region. The influence which, from a single coupling, is too feeble to be of extended benefit as modifying a race, by repetition brings to bear the cumulative effect of repeated infusions, and, aided by the selection which this very process of improvement would imply is being used, quickly changes a race into an improved breed.

A digression : This remark is intended for the breeder, and not for the user. A grade animal is superior to an unknown mixture for use, and I think the observation of my hearers will bear me out in the statement, that the so-called natives owe mostly the excellences which they possess, to some thoroughbred mixture; that is, every good native cow will generally have a Devon, or a Durham, or a Dutch, Ayrshire or Jersey strain, which can be recognized in her looks. Grades are good for their yield, but I am inclined to think that when used for breeding in any other way than by quick absorption into a thoroughbred, the variability produced by the cross renders the result of breeding extremely uncertain, and that a race can be improved much more readily than a mongrel. The infusion of good blood in our New England cows, haphazard as it has been, so widely diffused, and having produced in many cases some extremely good cows, yet is a positive detriment to building up our native race into a distinct and fixed breed. We must now look for improvement by absorption into a superior breed, or by replacement. A native breed, possessing a uniformity among its ancestry for many generations, and well acclimated, presents a simpler problem to the improver of stock, than another animal with distinctly recognizable traits of dissimilar blood, not yet bred out of sight. The powerful action of circumstances acting on a district, from some unrecognized pressure of self-interest, may and is, I believe, building up a breed in some sections, through the tribulation of necessity, and through the experience of repeated mistake and costly failure. Far easier would it be, and more for the public good, to supplant these efforts by a breed already formed and of recognized worth. By a correct system of action the present stock could be absorbed into a superier breed in a few generations, with an expense hardly recognizable, because so evenly distributed. All that is required is, combined action by a given community.

The dairy farmer has not a choice of breeds. The effect of climate and food is a constant that requires to be ever taken into consideration. The Short-horn originated in the fertile valley of the Tees; the smallest of the known breeds in distant Shetland. The barren pasture of Brittany furnishes a cow resembling the Dutch in all but size; the marshes of the Elbe, and the rivers entering the North sea, build up the large-framed Dutch This fact is well recognized in the sheep husbandry of England, and almost each district has its local breed. As competition becomes closer with the over-nearing West, and when more care must be taken to comply with the requirements enforced upon us by nature, in order to obtain a support from the dairy, then will this fact be fully recognized. In stocking a farm we must, to obtain the best results, look at the fertility of the pastures, their aspect, and the necessities of the season. Where soiling is exclusively or mainly carried on, human foresight is able to neutralize the action of natural causes to a certain exent, and to such a farmer there is some choice of breeds. But to the larger number this necessity is formed by the requirements of their land. The Dutch cattle with their large frames require fertile pastures, and lands unaffected by drought. Their home is among the marshes of Holland. The beautiful Short-horn, bred for ages to a special purpose, and lacking an extreme hardiness of constitution, is better fitted for fertile, rolling limestone pastures, and to exceptional locations in dairy districts. The Jersey is the rich man's cow, requires shelter and rich food, can be tethered with ease, is highly ornamental, and with her rich produce of milk can, if rightly located, be made profitable. But the Ayrshire is fitted by her past and present history for poor lands periodically withered by

drought and broken by hills, while at the same time she responds gratefully to good food and kind treatment That she is hardy is well known, even to a superiority over other breeds mentioned, and I throw it out as a conjecture, to be proved by statistics if at all, whether her very hardiness and adaptability to physical changes, has not rendered her less liable to abortion than the other breeds, under like circumstances and care.

The Ayrshire is not a royal animal, built up by high feed and pampering care, and adapted to rich pasturage alone. She is of the low-born, self-made class, which struggling for existence with the hardships of the earlier periods of Ayrshire, has improved with the growth of the country, retaining her hardiness and adaptability, and adding thereto the qualities of a certain yield of milk and dairy produce. She is the creature of the soil and her surroundings. She is not a beef animal and a milk machine combined. Meat is neglected in her inheritance for the more desired milk; and it is recognized by all impartial writers that the Ayrshire cow gives a larger product of milk in proportion to food consumed than any other breed. The properties of fat and milk-producing seem incompatible with each other, and with my experience, I am unwilling to admit that they can go on at the same time; but the same qualities in the Ayrshire cow which turns the nutriment of the food towards the udder, will, when the milk glands are inactive, store the products of her digestion in the muscle, and when dry this breed are therefore not wholly deficient as beef animals, but quickly get into condition. This happens from the preponderance of her inheritance towards the udder. When this preponderance is toward the laying on and storing up of fat, the udder becomes secondary, as we see daily in practice. When the breeder strives to unite the two, I fear the skill he can bring to bear will be unequal to the task, and the product will revert to the one or the other, as in Bates' Duchess tribe of Short-horns. We learn from history that the earlier Short-horns were famous milkers, and as we see that the present Yorkshires, which are stated to be the unimproved Short-horn, are noted for their milk, we see that somehow the improved Short-horns have fallen off as milkers, and although you may force an explanation of the fact in various ways, yet to me the fact seems to conclusively prove the incompatibility of high powers of gaining flesh and fat, with the powers of a large yield of milk. Moreover I have observed that when a cow has a strong tendency to increase in condition while in milk, she invariably is a poor milker, although she may give large quantities for a limited time.

Another digression: I have referred repeatedly to inheritance. Pedigree may be considered the strongest point in any breed, for without it we cannot have the reproduction of certain qualities. It is only through pedigree that the breeder's art can approach certainty. Pedigree, as generally printed, is simply an acquaintance with certain facts in the past history of an animal; the facts of parentage, and the undeviation from the type of the breed. Could it tell us more, it would be still more valuable. It does little in words—merely an outline of sires and dams and breeders by name; but this little, in the absence of more, is of the utmost importance. It is only through a familiarity with these facts that we can bring new blood into an old herd, or obtain a new one. It is essential for breeding to a fixity of type; consequently, I lay very great stress upon it. In the Ayrshire, the value of the pedigree is of unusual importance; for the functions of this breed are physiological, and cannot be recognized by the eye. We must depend much, in buying a superior animal, especially if young and untried, on the purity and breeding of her ancestry. There is, accordingly, the need of a public record of the parentage, breeding and ownership of the breed, as a guide to the public in purchasing, and as an assistance to the breeder. Such a record should carry, with the fact of record, a faith in the correctness of the record. There should be no internal proof of carelessness, no hint of slight in the work. There must be a belief, from the printed evidence, that each pedigree has been verified by the editor, by the best means in his power, conscientiously and without bias. I am sorry to say, the American and Canadian Herd-Book fulfils none of these essentials. It is inaccurate, careless, slovenly, and bears internal proof of its incorrectness. A new work of this kind is needed, and breeders must soon decide between the continuation of the present, or the starting of a new book. When the correct one appears, the buyer can approach the American breeder with the certainty of getting stock that will transmit good qualities. We have now as good animals in this country as can be found elsewhere, and we only need the confidence of an appreciative public to give an increased value to cattle already acclimated, and to check further importations, which are only necessary to insure correctness of pedigree. I trust breeders will look to this, their own interest and the interest of the farming public—for the two are conjoined. I trust breeders will protect themselves against the carelessness or dishonesty of individuals, members of their pursuit.

MEMOIR OF LUTHER TUCKER.

From the *Cultivator and Country Gentleman* (editorial) January 30, 1873.

Under the shadow of deep affliction, with a sense of loss that cannot be expressed, we have to announce the death, at his residence in this city, January 26th, of Luther Tucker, the senior editor and proprietor of this Journal. He had gone a little beyond the psalmist's limit of threescore years and ten, and with a life of less constant exertion might perhaps have looked forward to additional years of comparative repose; but close and continuous application from a very early period had worn upon a constitution naturally not robust, and when his last illness came, his friends were sadly apprehensive of the issue of the conflict. He had been at the office on the 14th for several hours, although not very well or strong, and on the morning of the 15th found himself too ill to leave his bed. Inflammation of the lungs followed, attended at the last by defective and irregular action of the heart, and when the fever left him, his strength gradually failed ; it became more and difficult to administer either medicines or nourishment, and finally, at an early hour on Sunday morning, so quietly that his last breath could scarcely be detected by those around his bedside, he entered into the rest of the unending Sabbath beyond the grave.

Luther Tucker was born in Brandon, Vermont, May 7th, 1802. The death of his mother, which followed almost immediately, broke up the family—his father and the older children shortly afterward joining the tide of migration to which Vermont has always furnished so large an army of recruits, while the subject of this notice was adopted in the house where he had been tenderly nursed and cared for in the hours of motherless infancy. At the age of 14, he was apprenticed to Timothy C. Strong, a printer of Middlebury, encountering in connexion with the instruction he received, the rougher fare and harder work that were natural enough at the time, but very different from the customs of the present. Mr. Strong removed to Palmyra, N. Y., in 1817, taking the young apprentice with him, but the connexion between them ended two years later, before the entire expiration of the term of apprenticeship. Mr. Tucker thus entered upon the prosecution of his craft, as a journeyman, somewhat

prematurely, making his way, with intervals of work at various intermediate points, toward his old friends in Vermont, for whom, and for the pure air and babbling brooks of its verdant hills, then, as through all subsequent changes, he entertained the warmest affection and most cherished memories. A tour of work on which he soon set out, carried him in the course of the five succeeding years, to various points in the north and east, and to Philadelphia, Baltimore, Washington and New York, and in the spring of 1825, he entered into partnership, at Jamaica, Long Island, with Mr. Henry C. Sleight, whose business was chiefly the publication of standard works for New York houses. Some volumes now in our possession, bearing the imprint of "Sleight & Tucker," chiefly English reprints of a moral or theological kind, are strikingly characteristic of the condition of American publishing at the time, but, in freedom from typographical errors and excellence of press work, they by no means suffer in comparison with the larger and more hurried editions of the present generation.

In his travels as a journeyman, Mr. Tucker had passed through Rochester in 1823, and witnessed the first crossing on the aqueduct over the Genesee, of the Erie Canal; and though the place was then little more than a village, he was struck with its evident capacities for future growth and prosperity. And when he began to look for a wider field than that afforded at Jamaica, Rochester was the point that occurred to him. Encouraged by his partner, who aided him with capital as well as with advice, at the age of twenty-four he turned his steps thitherward, and, entirely unknown among its people, began the publication of the Rochester Daily Advertiser—the *first daily newspaper* to spring into existence, west of the city of Albany, in the boundless and then undeveloped territory that extends to the Pacific. Its initial number appeared October 27th, 1826, and, as we learn from contemporary notices, at once attracted attention as showing the remarkable progress of the place. In referring to its establishment, the New York Evening Post of October 31, 1826, said: "Nothing can show, in a more striking point of view, the rapid increase of our population and internal commerce, than the fact that Rochester, which, within a few years was a wilderness, is now enabled, by the number of inhabitants and the activity of its trade, to support a daily paper."

The enterprise, in proportion to the business transactions of the day, and the simpler customs of a young and still struggling western town, was a success. But we have been already too long in tracing the steps by which Mr. Tucker reached what became the all-absorbing work of his life, to allude even briefly to his associates, or to the part he took in the active and often heated political discussions of a peculiarly exciting period. Wherever he had travelled he had been struck with the backwardness of our agriculture,—the lack of intercommunication among our farmers,—the tendencies of all prevailing practice toward the deterioration of the soil,—the almost universal absence of agricultural reading. His taste was strongly for farming, and other business he regarded as simply the resource from which he hoped to buy and cultivate land of his own, without indebtedness to others, and with reasonable provision in case of bad seasons and slow returns.

From this ambition, and his very considerable opportunities of observation among farmers in widely scattered localities, arose the establishment of *The Genesee Farmer*, January 1st, 1831, while still publishing the Daily Advertiser. If the general character of our agriculture was at a low point, he had also seen and marked instances, in his native State and elsewhere, of farmers of unusual sagacity, whose example, little known or heeded, even at home, was bounded altogether there, and who, with a wiser economy for themselves, were keeping up the fertility of their land, or sending out products from their dairies of higher quality, or raising grain of superior kinds and cleanness, or grazing their stock more successfully,—so that any general emulation of their course must add largely to the present and future resources of the country. And his aim, in a paper for the practical benefit of farmers, was primarily to elicit from such other farmers, the details of their experience and modes of practice, and to bring their example, so to speak, within the personal knowledge of his readers,—looking to what had been accomplished or was actually going on among the most intelligent and enterprising, for guidance as to what *might* or *should* be done, rather than to scientific investigation or the theories of the closet. It may not be too much to claim that the *Genesee Farmer*, though preceded in date of issue by a few other agricultural journals here or in Britain, was the first *to begin from this end*. The circulation of the *Genesee Farmer* rapidly increased, and this notwithstanding the establishment of *The Cultivator* at Albany by Judge Buel, under the auspices of the State Agricultural Society, in 1834, when some falling off might have been expected from the division of the field with a rival so able and influential; and it was somewhat to Mr. Tucker's surprise, on the union of the two journals, some years later, to ascertain that the circulation of his own was much the larger of the two.

Having at last attained what was to have been his great object, the purchase of a farm, near Rochester, the daily paper was sold in 1839, (it still exists as one of the leading and most popular journals of Western New York, under the name of the *Rochester Union and Advertiser*,) and farming, and the publication of the *Farmer*, were to be the sole objects of the future. But before a single season had passed, Judge Buel's death left the *Cultivator* without a head, and a proposition was made to Mr. Tucker for the combination of the two papers, that seemed in many respects so advantageous that the farm was sold, and the number for January, 1840, was published from Albany, and bore the title of "The Culitvator: a Consolidation of Buel's Cultivator and the Genesee Farmer." A "New Genesee Farmer," subsequently led a brief and flickering existence, and after the second part of the Cultivator's title had been dropped as too cumbersome, other "Genesee Farmers" came into fitful being—the last calling itself "the oldest paper" because of its borrowed title,—an attempt at appropriating a history as well as a name, of which there have been many other specimens in our periodical literature, but about which Mr. Tucker may perhaps have been excusable in feeling somewhat sensitive.

In respect to the details by which our departed Senior was led into the pursuit which became his life-work, we have spoken more fully, because no notice would be fitting, as it seems, without at least an outline of those preliminary steps by which and through which it came about that all the efforts he could put forth were thereafter devoted to the cause of agriculture. Our space will not admit of continuing the story further at this time, and, indeed under the circumstances of the moment, it has been a difficult task to proceed so far. Without the genius for manipulation, which seems to be essential in the political managers of the present day, it is possible that with all his energy, judgment and industry, he might not have attained, by continuing in the political field, the leading rank among those who have the credit of making or unmaking aspirants for public positions. With the same qualities, coupled with an admirable appreciation of the *real wants* of the community, agricultural or educational, but without training in that administrative capacity which consists so largely in the selection and employment of deputies by whom all details can be

wrought out under general guidance and supervision,—for a long time he retained in his own hands and under his own eye every department, business and editorial, and never felt quite satisfied when anything that could possibly be done by himself was left to another. The untiring work he thus assumed was often far too much for the individual energies of any one, but with heart and soul fully engrossed in its accomplishment, he escaped from serious results until the confinement to labour, which in his prime may have seemed natural enough, but in our day is rarely seen, began to tell, and he felt more and more, with the enfeebling heat of each successive summer particularly, that some measure of respite was absolutely essential. For a number of years past he had been forced from constant application, more or less, by absolute inability to continue it, and a large part of last summer he spent in freedom from care at various resorts popular with invalids and travellers. But as soon as he was at home, he was only contented with a certain measure of the office work; and it may be truly said of him, if the saying is anywhere strictly correct, that he died in the harness. In the wandering of his mind, after the fever had set in, he urged that manuscripts should be sent him for scrutiny before publication, specifying some that he remembered as coming in before he left the office; and, recollecting that the State Agricultural Society was about to hold its annual meeting, he was full of anxiety lest his illness might prevent his son's attendance, and eager to be up and at his desk for work.

His work was over. With the native predisposition for agricultural pursuits already referred to, it had been his task for many long years to weigh the merits of discussion after discussion and question after question, endeavouring to give due prominence to each in turn according to its deserts. Without prejudice or partiality,—admitting to publication what was counter to his own views, that it might stand upon its merits, and provoke thought among his readers,—he was never led away by any popular movement of the hour, and would allow little more attention to any subject just in vogue than he had always been willing to allot to it in times of public neglect. Clear, pointed and accurate in the use of language, what he wrote himself always came with weight. Of later years, with manual difficulties of penmanship rendering any prolonged exertion irksome, he wrote but little, but the guidance of his judgement and advice was ever present. Whatever he wrote was in all respects as he intended it to appear, and if he had been content to leave for printers the task of deciphering illegibilities and correcting sentences—in other words to abridge his own labour at the expense of others—he would probably have written more and at greater length. But to the last, he was equal to the work of editing and correcting the manuscript of others, however much it wore upon him; for the great aim of his labour, as he thought, was to give voice to experience that might otherwise be unknown, and he would rather take in hand a few pages from some unlettered correspondent, embodying the actual results of his experience, than deal with folios of correctly written and diffuse ramblings from writers whose syntax and etymology were above their actual knowledge of their subjects. For over forty years at the head of this Journal, with a constantly changing corps of correspondents, and with varying tides of public interest now elevating one subject and now depressing another, it has been more than ever remarked to us, as a feature attracting the special attention of careful readers of our agricultural literature, that the individuality and consistency that mark its whole history, though never obtrusive, were always evident, and that as a consequence, it had drawn to itself the special confidence of all who had watched its course and learned how high an estimate was to be placed upon its guidance.

In communication with those who acted under his supervision, as with many correspondents at a distance, personally unknown, Mr. Tucker seemed to possess an unusual power of attracting friendship and affection, of which we have often had evidences, and sometimes from quite unexpected sources. To those and we doubt not many others in the circle of our readers, his death will come like a personal bereavement. For ourselves, we cannot yet realize that his hand is stilled in death,—that his kindly eye will never more betoken regard or approval,—that his patient and loving voice is forever silenced. With time and other cares the sense of loss may weaken, but the lesson of his life and teachings will never be forgotten, and his example is a legacy which can never be spent.

In his personal relations Mr. Tucker was for many years a man of sorrow. Fairly under way at Rochester with the promise of his new experiment with a daily paper, just budding into fruition, the cholera season of 1832 that swept like a pestilence over the country, visited that place with unusual severity. His young wife and a boy of special promise, in his fifth year and already combining with rare sweetness of disposition a forwardness exceptional at his years, after but a few days struggle, were carried to the unending repose of the cemetery at Mt. Hope,—but they lingered for forty years longer in a recollection that until the last was never revived without the deepest emotion. The surviving husband and father fell into a decline from which it was long thought that he could scarcely recover. Marrying the sister of his former wife, she succumbed, in 1844, to consumption, the scourge of her native New England climate, preceded by one daughter and soon after followed by another. Smitten by repeated blows, though assuaged by all that *could* tend, in social and business relations, to mitigate their severity, he became constantly less inclined to mingle in public occasions, and more bound up in the welfare of those who were left to him. Since his third marriage, over a quarter a century has now elapsed,—a period of exemption from afflictions, and gradually closing over the scars of former wounds,—but he seldom if ever accepted invitations likely to bring him into prominent notice, and during the hot months of summer, which were especially trying to his constitution, was often so greatly enfeebled as to excite the serious apprehensions of his family. Of unvarying sweetness of disposition in the home circle to which he was so much devoted, the charity that speaketh no evil was equally prominent in his judgement of other men and their motives; and the memory of an injury was far less permanent in his mind than the recollection of favours received, and kindly words when the business horizon was clouded, and warm sympathies at times of trial. That the struggle of life had wearied him there can be no doubt, but his faith and gratitude, and unselfish efforts for the happiness of others, never wavered; and when his task on earth was over, it may be truly said that he fell asleep with a conscience void of offense toward God and toward man, and a heart unspotted from the world.

[From the *Cultivator and Country Gentleman* of Feb. 6.]

As the last issue of this Journal was necessarily sent to press on the day following the death of its lamented senior editor, the biographical notice then published was unavoidably much condensed, and indeed came to an abrupt pause at the period of his removal to this city toward the close of the year 1839, when the *Genesee Farmer* (founded by him at Rochester, Jan. 1, 1831) and the *Cultivator* as published by Judge Buel at Albany, were combined in a single periodical. The incidental reference to the *Cultivator* as having been originally established by Judge Buel "under the auspices of the State Agricultural Society," has also

given rise to some misapprehension, as we infer from notices that have appeared in other papers. That it was so established at the outset, is true enough; in the first number (March, 1834) reference is made to the Society as having "assumed the proprietorship of the *Cultivator*," but after a few years—at a date which a consultation of the volumes does not enable us to fix precisely—all right, title and interest in the paper passed into Judge Buel's individual ownership, and after his decease, Mr. Tucker's consolidation of the two periodicals was a matter or negotiation between himself and Judge Buel's heirs, with which the Society had no connexion whatever. The latest issue in which the Society is mentioned as proprietor is that of December, 1837, and as the corresponding imprint is omitted in the following number, we may assume that it was at the beginning of 1838 that the *Cultivator* became solely an individual enterprise.

The point is one of no special importance except in illustration of the fact that Luther Tucker was so thoroughly self-reliant (if the word is admissible) in all his undertakings—deciding for himself where there was room and need for effort, making it on his own responsibility, and when once made, never in a single instance failing to carry it through. As a stranger he began in a strange place the publication of the first daily outside of the older cities on or eastward of the Hudson. With only an overpowering conviction of the vast individual and national importance of agricultural improvement, he founded the *Genesee Farmer*, and won for it a popularity which, in proportion to the growth of the taste for reading at different stages has never been exceeded before or since. And when that journal and the *Cultivator* became one, it was supported and strengthened, not by the influence of any organization, or by the labours of others, but simply by his determined zeal and unflagging exertions.

In coming to Albany, and for such a purpose, it was natural however, that Mr. Tucker should feel a deep interest in the Agricultural Society of the State, and, on the other hand, that the members and friends of the Society should gladly avail themselves of his assistance and energy in carrying forward the objects for which it was organized. Accordingly we find that at the annual meeting held Feb. 5th, 1840, Mr. Tucker was elected its corresponding secretary. The Society had been organized in 1832, but beyond the holding of yearly meetings at Albany for the election of officers, the publication in the papers of the result of the elections, with some speeches and reports, and the assistance afforded to Judge Buel in launching the *Cultivator*, it had never manifested great life or activity, or attracted general support throughout the State. Of the officers of 1840, the president was the now venerable Francis Rotch of Otsego; there was one vice-president each from the counties of Albany and Schenectady, and three from Rensselaer; and Columbia, Greene and Schenectady were each represented by one member in the executive committee, the whole covering, as will be seen, but a very limited area. Before the annual meeting of February 10th, 1841, Mr. Tucker had moved that the Society be disbanded, and allowed to give place to some new association, unless it could be made to assume a position more in accordance with the necessities of the case. Thus awakening the Board to the possibilities within the Society's reach, and the position it should assume, and calling to its aid a wider support from all other parts of the State, a new constitution, prepared by his own hand, was adopted at that meeting, containing among other provisions the requirement for the holding of "an Annual Cattle Show and Fair," and the officers of 1841 included a vice-president for each of the eight senatorial districts of the State, so that every locality was recognized and represented. In order to compress these notes within anything like reasonable limits, we have been compelled to omit any reference to the many friends and associates of the deceased, with whom, at various periods, he was more or less intimately connected, but in such ways that mention of the fact was not essential, and would only have led to undue prolixity. Of those who took an active part with him in the reorganization of the Society, however, it is not improper to mention that he received especial support and assistance from Ezra P. Prentice of this city, who was elected Treasurer; from the late Alexander Walsh, of Lansingburgh, who continued, as before, a member of the executive committee; and from the lamented Benjamin P. Johnson, of Oneida, then chosen a Vice-President, subsequently President, and afterward for so many years Secretary of the Society. To these names should be added that of the late Gen. James S. Wadsworth, of Geneseo, who became President of the Society in 1842; and there were of course very many others whose co-operation was most valuable and most highly appreciated but to whom we could scarcely refer, even at this late date, without risk of seeming to make invidious selections.

It was thus and then that our State Agricultural Society became really a living and working body, and though availing itself of the charter granted in 1832, it was legally the same corporation as before; for all practical purposes it was wholly a new organization, with a new constitution, new management, and wider plans. The first result of the meeting of 1841 was the presentation to the State legislature of a law drawn by Mr. Tucker, in pursuance of a resolution unanimously passed by the meeting (and also prepared by him, though introduced by another) appropriating the sum of $8,000 a year for the assistance and support of all the various agricultural societies of the State, being the "act for the encouragement of agriculture," passed May 5th, 1841. This appropriation, at first covering each of the five succeeding years, has ever since been continued on our statute books; the only material change made in its provisions having been the increase of the amount within a few years past; and it is no more than justice to Mr. Tucker that its origin should be made known to those who have so largely profited by its results.

The first "cattle show and fair" of the Society was held at Syracuse, Sept. 29 and 30, 1841, when a good display was made, and an enormous attendance of visitors elicited. It was followed in February, 1842, by a winter show of grain and dairy products; and the general programme was thus inaugurated, which has since been followed by the Society for so many years without interruption or failure. In 1842 and 1843 Mr. Tucker continued to hold the labouring oar as Secretary, devoting no small part of his time to the Society's interests, wholly without compensation, and furnishing office room for the meetings and all required stationery, as well as editing the annual volume of its transactions, which was one of the new features of its reorganization, and constantly occupying a large space in the *Cultivator* in its favour, neither asking nor receiving, directly or indirectly, the slightest remuneration. He was simply at work with others for what he thought to be a great object, and, occupying a position in which his services were of special utility, he felt the heavier responsibility in contributing to its accomplishment. On the ground that the Society had become able to pay for a secretary's services, he declined the office in 1844, but the new incumbent occupying it for that year alone, much against his wishes he was again elected in 1845 and 1846, but insisted in January, 1847, upon the acceptance of his resignation, and the late Col. Johnson was then appointed his successor. In 1848 he was a member of the Board, and from 1849 to 1852 successively was Treasurer (again without remuneration), and on his final retirement at the close of the last mentioned

year,* a series of resolutions was unanimously passed, presenting to him, with the thanks of the Society, a service of plate of the value of $500. For eleven years —almost without intermission years of devoted application in the Society's behalf—the sum, in a pecuniary point of view, was not only inconsiderable, but actually much less than the personal outlay he had probably incurred; but as a testimonial of appreciation by those who best knew with what spirit he had laboured, the gift was always most highly valued, and from the value he placed upon it, will always be preserved and cherished by his descendants.

In 1846, Mr. Tucker was led by the scanty character of the distinctively horticultural literature of the day, and by the urgent persuasion of many gentlemen warmly interested in the subject, who came to him instinctively as the one most likely to lead the enterprise to a satisfactory result, to establish the *Horticulturist*, the first number of which appeared for July of that year, with the late A. J. Downing as editor. The new magazine at once assumed a position of influence which no other American periodical of the kind has been able to attain. Its circulation was not large in numbers, though even in this respect it reached a point which has only been temporarily exceeded, we believe, and that in rare cases, by any contemporary in the same department. On the death of Mr. Downing in 1852, and with the view of concentrating all his energies upon the establishment of the *Country Gentleman* the succeeding year, Mr. Tucker sold the *Horticulturist*, and its connexion with his name and memory entirely ceased.

Another undertaking, entered upon toward the close of the year 1845, should not pass without brief mention. Perceiving the advantages of Albany as a distributing centre, and the lack of any general depot for agricultural implements at this point, Mr. Tucker furnished the capital for the establishment of a warehouse and seed store, confiding its business transactions entirely to the charge of an active partner. It seems to have taken about nine months' management on the part of that gentleman to sink nearly the entire investment; the partnership was abruptly dissolved, and the business was necessarily conducted, until other disposition of it could be made, in Mr. Tucker's individual name. It shortly afterwards passed into the hands of Mr. Horace L. Emery, the head of the firm now carrying on an extensive manufactory of agricultural machinery here, and it was through its establishment, incidentally, that Albany became a point of so much importance in this branch of productive industry.

In 1853, as already stated, the plan for founding a Weekly Journal, which Mr. Tucker had for some time been considering, was finally matured, and from that date all other engagements were set aside. In the selection of its name, as well as with regard to its general purposes, Mr. Downing had been frequently consulted, and very possibly, if death had not intervened, he might have been associated in its editorial management. The following extract from one of Mr. Downing's letters (written some months previously) was published in its first issue: "I am delighted with the idea conveyed by the title you have adopted, the *Country Gentleman*. It suggests an idea that should be cultivated by every farmer and gardener in the land. It seems to take a proper step toward that station in society that the agricultural community are entitled to." It certainly was ever the most sincere and earnest wish of its editor and founder, that in promoting as it might the improvement of our agriculture, it should also tend to educate to higher aims and wider views the minds of its readers; to add to the taste, refinement and comforts of their homes; to increase their self-respect, individually and as a class, and the respect entertained for them and their calling by other classes. Twenty years of almost unintermitted labour toward this end, he was spared to exert—years that were uneventful as compared with previous periods of his life, but the history of which is recorded in the ever faithful and painstaking supervision to which its volumes bear witness; and we doubt not in the respectful and affectionate regards of thousands of its readers.

* From the circumstance that his son, Mr. Luther H. Tucker, was elected Treasurer of the Society in 1858, a number of obituary notices of Mr. T., senior, speak of him as having occupied that position subsequently to 1852, and down to the time of his death. As matter of accurate record, however, it may be added that Mr. Tucker was elected Recording Secretary of the Society in 1855, but his name was used without his knowledge, and he took no active part in its affairs. He also served two or three years, at about the same period, on the Board of the Albany County Agricultural Society, for the sake of lending his influence to the effort then making for its revival, although unable to devote much personal attention to the subject. For some time prior to 1853 he was Treasurer of the Albany and Rensselaer Horticultural Society—an association organized in 1847, and for several years quite successful in its exhibitions. He was also one of the original corporators of the University of Albany, founded in 1851, and Treasurer of the Board of Trustees. A course in Agricultural and Scientific Instruction was organized by this institution for the winter of 1852, under the charge of the late Prof. John P. Norton of Yale College, but its subsequent prosecution was interrupted by the untimely and lamented death of that gentleman.

THE PRODUCTION OF MILK AND SOME POINTS IN ITS TREATMENT.

Paper read at the annual meeting of the New York State Agricultural Society at Albany, Jan. 22d, 1873, by X. A. Willard, M. A., of Little Falls, N. Y., President N. Y. State Dairymen's Association, and Board of Trade, etc., etc.

The annual milk interest of the United States may be expressed by the following formula: 1,800 quarts of milk at 2⅓ c. per quart=$42 x by 10,000,000 cows =$420,000,000.

The 1,800 quarts represent the average annual yield of a cow during the year. If we put the milking season at 300 days, the average yield would be at the rate of six quarts per day. The 1,800 quarts would make about 360 pounds of cheese, or say 150 pounds of butter.

We have statistics showing pretty nearly the value of the milk crop of the United States, in items as follow:

Milk consumed as food, at 2⅓ c. per quart..	$218,000,000
Condensed milk....	1,000,000
Butter product, 700,000,000 lbs., at 25c..	175,000,000
Cheese product, 240,000,000 lbs., at 12c. per pound	28,800,000
Value of whey and sour milk from cheese and butter manufacture, converted into pork and calves....	10,000,000
	$427,800,000

A value very nearly that expressed in our formula.

Commissioner Wells in his report on the commerce and industry of the United States in 1869, estimates the annual value of the products of the dairy, after deducting the value of products consumed on the farm, at $400,000,000. He believes that his estimates fall considerably within the mark, and in proof of this assumption he instances the dietary of factory boarding houses, where the operatives were in a large part French Canadians, notoriously frugal and simple in their habits, and in which they were furnished to their own satisfaction, which showed an average consumption of butter amounting to about $16.51 per year. An average consumption for the entire population taken at one-half this sum, or $8.25 per head, would result in the expenditure on this account of $321,000,000.

A consumption of milk to the value of one cent per

day for each person would give an additional sum of $143,850,000, making a total of these two items of $464,000,000.

Any one who is acquainted with the manner in which milk, and more especially butter are consumed in the families of American laboring men, as well as in the houses of the wealthy and well-to-do classes, will acknowledge that these estimates are low. These enormous values are to be disposed of annually, and it is a matter of interest to dairymen to know where they are placed. Nearly the whole bulk of our dairy products is consumed at home: for if we refer to official statistics we find that about 60,000,000 pounds of cheese, and about 7,000,000 pounds of low grade butter, much of it known under the name of *grease*, go abroad. The value of our entire surplus in dairy products may be put at the following figures:

60,000,000 lbs. cheese, 12c....	$7,200,000
7,000,000 lbs. butter, 25c	1,750,000
Condensed milk......................	500,000
Total	$9,450,000

An additional expenditure of 24 cents per year for each person, or two cents per month in any form of dairy product would wipe out our surplus and leave nothing to go abroad.

It is believed by many that the cheese product of the United States at the present time is no more than is annually needed for home consumption, provided the consumption be distributed properly over the year. It is estimated that we have 30,000,000 of people who would consume cheese were it of unexceptionable quality and conveniently supplied. Say that each consumed eight pounds a year at a cost of fifteen cents per pound, or $1.20, and our whole product would be consumed. At this rate one cheese of sixty-four pounds weight would supply a family of eight persons for the year. Eight pounds a year would be at the rate of about two and a half ounces a week—a small item surely, considering that some men not unfrequently make away with a half pound or more at a meal. I am more and more convinced that it is upon home markets that we must rely for obtaining a fair compensation for our products. There are hundreds of villages in the United States where it is impossible to get a pound of good cheese from one end of the year to the other. We need to introduce among us the English system, where every village has its cheese store, and where customers can be supplied with variety of styles and qualities, small cheeses as well as large. People cannot be expected to buy cheese unless it can be conveniently had, and in such form and quality as will suit especial wants and tastes. The American system of depending upon a foreign market, and forcing forward immense stocks in hot weather is a vicious system, and must always prove more or less disastrous. Let us reason upon this matter without any absurd theories or speculations. I shall appeal only to your common sense for a practical solution of the question. I affirm that the factory system of curing cheese and marketing in hot weather is grossly defective, is a shameful waste of the hard earnings of dairymen.

The great bulk of the factories in the United States and in Canada have no conveniences for curing cheese properly, and have no provision for accumulated stocks. The cheese curing process is one requiring skill and attention to details second only to the manipulation of the milk. The fundamental principles in this department are almost entirely overlooked and ignored by the cheese makers of this country. From the time the cheese goes from the press to the market, it is left to take its chances with the weather, and its quality, when produced from good milk, varies precisely as the weather happens to approximate to a certain uniform temperature—a temperature science verified by practical experience has demonstrated to be the true range of heat for producing fine cheese. We now know that the whole art of cheese making consists in the proper development of a peculiar species of fungi, and that the trouble in cheese making also arises from another class of fungi, more or less vicious in character, which gets possession of the milk and curds, or the cheese upon the shelf, overmastering the first-named organisms, which are the cheese makers' real friends. Their action is altogether harmful, and according as they have been allowed to develope and take possession of the cheese is the product inferior, poor, bad, or worthless. Now, the useful class of fungi must have a temperature favourable to their growth and development. The cheese maker's art is to mould them to his will, to induce them to perform a specific office, to attack the casein or nitrogenous elements of the cheese and to break it down into a mellow, plastic state, without doing injury to flavour; in fine, to prepare it in the best form both as to healthfulness and taste for the human stomach. This, under certain conditions, it will do with mathematical precision and certainty. You know how plants and animals are moulded to do the bidding of human intelligence: how Bakewell produced his sheep; how Colling, and Bates, and Booth have made their Shorthorns? How the pomologist has changed the sour and bitter crab into the large and luscious apple.

You see how even inanimate nature has been made to do our bidding. How water in the steam engine has become the great propelling power of the world; how lightning chained to the telegraph has been made to talk. God has given us unbounded limits of power over animate and inanimate matter, providing we employ the immutable law that governs it. So these minute microscopic fungi, under the hand of intelligence, will do our bidding in the cheese vat and upon the cheese shelves, if we understand and apply the law which the All-Wise Creator has laid down for the government of their being. Now, to obtain the best results, the growth and development of the fungi (or in other words the fermentation of the cheese) must be uniform and continuous. You cannot induce excessive activity one day, followed by a cessation, or checking of the process, the next day, and so on, and obtain a high standard product.

Cheese made from good milk and with only ordinary skill in manufacture, when placed upon the shelf in a well ventilated cheese curing house, and kept in a uniform temperature of 70° to 75°, will almost invariably cure down fine in flavour and quality. The action of these fungi (call it fermentation if you choose) is peculiar and not yet fully understood. Certain it is, however, that they have the power of converting casein into fat, or a substance similar to fat, and hence by attention in curing, a cheese made from milk partially skimmed may have as mellow and meaty an appearance and taste as whole milk cheese cured in a variable temperature. This is a fact abundantly proved by science, and has been fully demonstrated by the analyses of Voelcker. This peculiarity in the manufacture and curing of cheese was brought to my notice in 1866, during my examination of English dairies. Mr. Harding, the distinguished exponent of Cheddar cheese-making in England, always insisted that the goodness and delicate flavour of the cheese depended as much upon the temperature and manner of curing, as upon any extra manipulation in making. He affirmed that by keeping the temperature of his curing room at 70°, without variation, he could remove a considerable portion of cream from the night's milk, and then be able to make a cheese that would sell in the London market for the highest price. It was his usual custom to take the

cream from the night's milk, and I have never seen or tasted cheese more perfect in flavour, or with more of the characteristics of what we term "fine cheese," than that which I ate at his table. His curing room is surrounded with a nest of iron pipes, which are supplied with hot water from the boiler below, whenever the temperature of the curing room falls below 70°. In the low, even temperature of England, his curing room, built in with heavy walls of hollow brick, and with ample provision for ventilation, seldom varied in temperature from 70°. I have experimented sufficiently in my own dairy to know that with good milk and with a good curing room kept at 70° to 75° there is no necessity for bad flavour, and that cheese can be kept from one year's end to the other and retain that mild, rich, nutty taste which the English so justly characterize as the best manufacture. I feel in earnest about this matter of curing cheese, because I am convinced its neglect is the great fault of American factories. The complaint is quite common that American cheese will not keep. The secret of long-keeping cheese is not so much in its manufacture as in the milk from which we make the cheese and its curing. Our dairymen complain that prices are low and are seeking for a remedy. The remedy lies in better milk and in larger and better curing houses.

In New York there is not a single factory within my knowledge than can hold cheese over in hot weather and retain its flavour. Even under our system of weekly sales immense quantities of July and August cheese are overheated and tainted in flavour when they leave the factory. Then there is not one factory in a hundred that can hold more than six or eight weeks' make of cheese. You hear of immense shipments of cheese in hot weather and at low prices. Well, the factories are *forced* to sell. They say, "we dare not keep it, for it is beginning to turn in flavour, besides our rooms are full and it must be sold." Now is it any wonder that dealers buy low and that dairymen are placed at disadvantage? Why, my friends, you and I and everybody else will buy as cheaply as we can. Has it not become a proverb that "you cannot realize the full value on forced sales?" Now this is the condition of the American cheese market during a large part of the year and England knows it, and our own cheese dealers know it. But the dealers after purchasing are anxious to get rid of the goods quickly, especially in hot weather. They have an article upon their hands which they know is constantly depreciating, and is liable to be lost altogether, and so they shift the responsibility as soon as may be, making what margin they can. It is just so in England It is known that much of our cheese will not keep, and shippers are on nettles until they clear their warehouses of stocks as fast as they come in. It is this over anxiety, this hot haste to have our product change hands for fear of loss that brings prices down. You will observe that English Cheddar holds its own at 76s to 80s the cwt. year after year; why? because it can be held a long time without depreciating.

Supposing every factory had a cool place for storing but 200 cheeses, in hot weather the quantity in the aggregate would be very considerable. There are over a thousand factories in the state of New York alone; say that there are 1500 in all that can store 300 cheeses each, above present capacity; the gross amount would be 27,000.000 pounds. This amount kept from the markets in hot weather—safely kept, with no fear of deterioration, but retaining its flavour and growing better in quality—would so relieve the trade that good prices would probably result on that shipped. *I would not advise the keeping of cheese at any time when fair living prices can be obtained for it.*

Now I have tried to show you some of the advantages that would result from curing cheese properly, and from having sufficient store room to hold a certain amount of hot weather cheese during hot weather. Let me illustrate how this course would be likely to affect the market. In the first place the quality and flavour would be improved. In the second place by withholding a portion of the stock, and not crowding the market at a time when the hot weather makes it a fearful risk for dealers to handle large quantities, you will be able to maintain a price for what you *do* sell. This is a natural consequence, and is one of the laws of trade. By pushing your whole product forward, the risk and the glut in the market force prices down, as they have the past year, to 11 and 12 cents. But suppose you hold back a third of your make, selling two-thirds at increased rates, or for what it is worth, say 16 cents. Take 300 pounds of cheese for instance as an illustration. The 300 pounds at 11 cents would be $33.00. That represents the present system. But if you keep back 100 pounds, selling the 200 pounds at 16 cents, you have $32.00, or within one dollar of the receipts first named, and the 100 pounds remaining back. In other words the 100 pounds remaining in your curing room if sold at one cent per pound, would bring you out even with sales made according to the first system. This is the English plan. They do not force forward their goods in hot weather when they *must* be sold at a sacrifice on account of depreciation and decay from heat; but they sell only so much as will go freely into consumption at a good price.

I have said that one great fault in American cheesemaking to-day, is in the curing of the cheese. I have said that with proper attention to curing, and with only ordinary skill in manipulating *good milk*, a first class product can be made, and I reiterate the affirmation, but I wish to call attention to that part of the affirmation expressed in the two words "*good milk.*" I do not mean imperfect milk resulting from want of cleanliness and the general care of milk after it is drawn from the cow; that matter has been discussed from time to time at our dairy conventions, and farmers ought to be pretty well informed upon the evils coming from such filthy practices. Dairymen, it is true, are not generally up to the mark in this respect, for there are vast quantities of cheese every year injured on this account. But you will understand that among the "gilt-edged factories," this matter of cleanliness is becoming more and more rigidly enforced among patrons. Now, the question upon which I desire to call your attention, is concerning those causes of bad milk lying back of these common and flagrant ones.

Perhaps the most prolific cause of bad milk in such instances, is the cows drinking the water of stagnant pools, tramping through swales of mud which are alive with filthy organisms of decomposing vegetable or animal matter. I need only to refer you to some facts coming under my own observation, and the result of scientific investigation by Professor Law, of Cornell University, to show you how milk may be spoiled while the dairyman suspects nothing wrong.

Experience and scientific investigation have established the fact that milk is spoiled in the cow's bag, simply on account of the cows inhaling bad odours while at pasture. We have numerous instances, where deaconed calves thrown out and left exposed in a portion of the pasture, where dead horses, and the carcases of other animals have been allowed to putrefy in such places, and cows inhaling the stench from these decaying remains of animal matter, of the milk taking a putrid taint before being drawn from the bag. This taint may not be perceptible the moment it is drawn any more than the physician can detect smallpox in a person who has recently been exposed to that disease, but the seeds or germs of putrefaction may be there nevertheless, and, in the case of the milk, begin

to show themselves, and to give trouble to the cheese maker, before his curds are ready for the press. Or if he succeeds in getting the curds in press without much difficulty, the cheese not unfrequently shows an early taint, decays quickly, and turns out bad. The troubles from this source are much more frequent, and produce more extensive evils than are commonly supposed.

I have seen numerous cases where the milk has received a taint from particles of dust falling from the cows into the pail while milking, and unsuspected of doing harm by the milker. Cows that are allowed to pass through sloughs of mud, places filled with decomposing animal and vegetable matter, get their udders and bodies more or less bespattered with this filth. At the time of milking, this dirt has become dry, and the more bulky portions may have fallen off, but enough remains to form a dust which, in the process of milking, enters the milk, and thus the seeds of a filthy decomposition are sown. You may not be able to detect anything bad in such milk for an hour or so after milking, or when it arrives at the factory, but it is nevertheless bad, and will cause trouble, either while the milk and curds are being manipulated, or in the flavour of the cheese upon the shelf. Farmers generally have not understood or appreciated these things. They have been looking wholly to the art of the manufacturer for securing a good product, assuming so long as milk can be got to the factory before it sours, or before it becomes rotten or stinks, all responsibility is shifted upon other shoulders than their own.

And in this connexion I must refer you to two notable cases illustrating the point in question. In the summer of 1870, while on a visit to Mr. L. B. Arnold, of Tompkins county, New York, I saw an instance of dust inoculating milk brought to the factory. When the milk was received at the factory window there was no reason to suspect taint from any particular dairy. The delivery from the several patrons went into the vat together, and was set in the usual manner with rennet. But during the process of heating up the curds, a most intensely foul and disagreeable odour was emitted. The cheese maker sent for Mr. Arnold and myself, and we went down to the factory together. We found the curds then about half scalded, giving off a stench exceedingly offensive—a smell like that coming from a nasty mud hole stirred up and exposed to the air in hot weather. There was no mistaking the peculiar odour, and I suggested at once that some of the patrons were allowing their cows to slake their thirst from stagnant pools. He afterward traced the milk to its source and found the trouble to come from one patron, who, after turning his cows to the after feed, had allowed them to cross a narrow slough where particles of mud adhering to the udder and hair, and becoming dry, the dust entered the milk during the milking, and had introduced a class of fungi which by their multiplication spoiled the milk. The patron had meant no harm. He had taken every precaution so far as his knowledge extended for the delivery of good milk, and on correcting the fault the trouble ceased. Another case, which occurred during the summer of 1871, is in point. Prof. Law, of Cornell University, gets his supply of milk from a milkman. One day during the hot weather he observed a peculiarity in the cream rising on the milk. It appeared to be ropy, and on subjecting it to an examination under a powerful microscope, it was found to contain a large number of living organisms in different stages of growth. Pushing his investigations further, the Professor called upon the milkman to inquire concerning the management and keep of his cows, and the manner in which the milk was cared for. And he suspected the trouble came from the water the cows were drinking. Taking specimens of this water and examining it under the microscope, the same class of organisms was found as those in the milk. It was now pretty evident where the cause of the trouble lay; but to make the matter more clear, specimens of blood were taken from the cows, and examined under the microscope, when these also were found to contain the same class of organisms.

The animals, on applying thermometer tests for determining health and disease, were found to be hot and feverish, thus showing that these living organisms introduced through the medium of the filthy water and taken into the circulation, and by their power of reproduction and multiplication in the blood, became the source of disease. Investigating still further, a particle of the filthy water was introduced into milk free from such organisms, and known from tests to be in good order, and in a short time the same filthy organisms multiplied and took possession of it in vast numbers, producing the same character of milk as that first noticed. Other experiments and investigations were made, but all similar in result to those I have described. These facts are of very great impoitance to dairymen, and although it was known that the milk from cows drinking the putrid and foul water of sloughs and mud holes had caused much trouble at cheese factories, still dairymen hardly appreciated the full extent of the trouble or were aware of the precise nature of the injury caused by such water. If the lives of those foul organisms are not destroyed when taken up by cows in their drink, but pass into the circulation, tainting the blood, entering the secretions and establishing their filthy abode in the milk, there to increase and multiply in vast numbers, causing the milk to be a mass of filth; then it is reasonable to suppose that persons partaking of this milk, even when freshly drawn, are liable to have their blood also inoculated, and thereby contract disease. Who can say that malignant fevers and fatal epidemics do not often originate from these sources? The facts brought out in these investigations would seem to warrant the supposition. At any rate they are sufficiently startling, and should arrest the attention of those who have the care of milk stock, and who are in the habit of using milk freely. They prove that clean water is at least a prerequisite for the cow to yield good, healthy milk, and that there is more danger in allowing stock to slake thirst in foul, stagnant pools, than has commonly been supposed.

In my report upon English Dairies in 1866, made to the American Dairymen's Association, I called attention to the character of English milk as cleaner than ours, and I attributed the finer flavoured cheese of England, in a great measure, to this one cause. Nothing struck me with more force than the care taken by the Cheddar dairymen of Somersetshire to get good milk. The pastures are well drained, and provided with an abundance of clear, running water. There are no filthy pools or mud-holes where cows are allowed to tramp and wallow in search of water. The milking sheds are open on one side, paved with stone and cement. There is sufficient incline back of the cows, so that all filth flows into the stone gutters, and after milking, all the droppings are removed and the floors and gutters are flushed with water, so that everything is clean and sweet for the next milking. The liquid excrements and washings are conducted into a tank sunk into the ground, outside the milk-house, and from thence, as occasion requires, are applied to growing crops. You will see that under this system of clean pastures, clean stables, and clean dairy-houses, a better milk is obtained than with us, and thus with proper attention to curing cheese on the shelf, the Englishman, with less skill than ourselves in cheese

manufacture, is enabled to make a superior product. I am convinced that unless the dairymen of America commence at once to pay attention to cleanliness in pastures, not only in regard to slough holes, but the eradication of weeds, providing stock with an abundance of fresh, clean water, together with attention to curing cheese, European manufacturers will soon outstrip us in the race "for making fine goods." The factory system is now being established in Europe. All our inventions and appliances are eagerly sought after, and every good thing discovered by us adopted. England, Sweden, Germany, Russia, Holland and Switzerland are adopting our factory system. Under monarchical governments and hereditary land-tenures like those of Europe, the farmer is compelled by his landlord to farm in certain directions, and the result is a systematic regular course of husbandry, by which better results are obtained than with us, where every farmer does his work in a hap-hazard way without any regard to science, or a rational system of culture. Dead carcases exposed to the air to putrify, cess-pools reeking with filth, stagnant water filled with decomposing vegetable matters are regarded as public nuisances, and those permitting them on their premises are liable to criminal prosecution.

Now in regard to milk, we are no longer left to grope along blindly in the dark. Hallier, Pasteur, and a host of other distinguished investigators have, with the aid of the microscope, demonstrated how milk is changed from its normal condition by fungi—how these minute organisms emanating from filthy matter get possession of the milk, and convert it into a state similar to that substance from which they emanate; and it is from this standpoint, established as a truth by scientists, that American dairymen must base their operations. The trouble heretofore has been that we had no sufficiently established starting point. We were experimenting with the *effect*, without understanding definitely the nature of the *cause*.

But now, clearly understanding the cause *and* its effects, we can apply the remedy. I have no doubt the terrible disease known under the name of "milk-sickness," so prevalent in Indiana and other parts of the West in hot weather, will be traced to certain species of fungi in the milk, derived from bad water or some vegetable decomposition. These enter the circulation of the animal and poison the milk, and it is not the result of any poisonous plant the cows eat.

In conclusion I feel constrained to allude to a branch of dairying concerning which hitherto very little has been known by the dairy public. I refer to condensed milk, the profits upon which are enormous, a business now in its infancy, but which in my opinion is destined to have a very important bearing upon the dairy.

Statistics show that nearly half of the milk produced in the United States is consumed directly as food. We have between ten and eleven millions of milch cows. Thus five million cows are required for supplying fresh milk for consumption. If we add the milk supplied by the cow with the iron tail, the water dilution, it is estimated, would be fully equal in quantity to the product of a million cows more. Now the condensing process is simply eliminating 75 per cent. of water from pure milk, and putting before consumers a reliable article of long-keeping qualities, purer and more wholesome than milk as usually sold, because the process of condensing kills those organisms which are often the cause of disease in impure fresh milk. To give you some idea of the profits realized from this business, I will merely mention that a pound of preserved condensed milk sells for 29 cents.

The cost of the crude milk, at three cents per quart, and preparing it for market, is as follows:

	Cents.
1½ quarts of milk, 3c. per quart	4½
6¼ ounces best refined sugar	4¼
Condensing	1¼
Can	8
Canning, etc	¼
Total	18

Leaving balance, as clear profit after paying all expenses, of 16c on three pints of milk. A cow yielding on an average twelve quarts per day would at this rate yield a daily profit, after allowing three cents per quart for her milk, of $1.28. At the condensing factories the milk is bought of farmers at from three to five cents per quart, and the profits I estimate are about a dollar a day on each cow after paying farmers the prices I have named for the milk. There is an export demand for condensed milk, and it goes largely into use for ships' stores. I was told at the meeting of the American Dairymen's Association that the condensing factories of Massachusetts and New York had recently received an order for eleven million pounds from China. Be this as it may, there is no doubt a trade with China in this article could be inaugurated. It is a valuable product, and should come more generally into use than it has.

ON SOME EXPERIMENTS OF THE CULTIVATION OF THE SUGAR BEET ROOT IN THE STATE OF NEW YORK IN 1872.

BY CHARLES A. GOESSMAN, PH. D.

Among the many experiments of the past year, concerning a successful cultivation of the sugar beet roots for *the manufacture of sugar*, which have come to my knowledge, are those of particular interest, which have been carried out at the request of the Secretary of the New York State Agricultural Society; for the field of observation extended across the entire State, and the seeds used in all these experiments were taken from one and the same package, imported directly from leading dealers in Germany—Messrs. Rabbethge & Gieseoke, of Klein-Wanzleben in the Province of Saxony in Prussia. As the writer has tested quite a number of roots from each of these experiments, he proposes to state, in a few subsequent pages, his results with a short comment regarding the causes of their differences. Each examination of roots is accompanied with an abstract of the reports furnished by the parties engaged in their cultivation. All tests—if not otherwise stated—are made with roots of a corresponding weight, to impart a comparative value to the results noticed. The roots had been freed, in most instances, from their leaves, and were packed in an unlacerated condition in moist soil or moist straw, when sent for examination.

I. *Report of Thomas J. Hand, Esq., of Sing Sing, Westchester Co., N. Y.*

The farm is located on the east bank of the Hudson, opposite Croton Point. The field upon which the experiment was carried on, forms a plateau about one-eighth of one mile from the river, and one hundred and twenty-five feet above its level. The soil is a loam, two feet deep, and rests upon a stratum of hard-pan from five to six feet in thickness, which is underlaid by a quicksand deposit of unknown depth. The land has been drained in previous years quite effectually, by breaking through the hard-pan in depressed spots, and by filling in subsequently with coarse gravel to the height of the ordinary depth of ploughing. The field was used for several years for the production of grass; the preceding crop had been tomatoes, which was ma-

nured with phosphatic-blood-guano; before planting the beet seed, it was again dressed with the same fertilizer, in the spring of 1872, at the rate of five hundred pounds per acre. Repeated ploughing and harrowing had brought it into an excellent mechanical condition. The seeds were soaked and subsequently rolled in ashes and plaster; thus prepared, they were planted by means of a seed drill (about the middle of May). The rows were twenty-eight inches apart, and the young plants thinned out in due time, leaving a space of six inches between succeeding individuals. The cultivation was chiefly performed with a horse hoe. Yellow Globe and French sugar beet seeds, bought of a New York city dealer (Messrs. Bridgeman & Son), were planted along side of the imported sugar beets, on trial. The season being very dry in the earlier part of the summer, was not very favourable for the experiment. The imported German sugar beet looked best in the fall, and produced at the rate of sixteen tons per acre; the Yellow Globe and the French sugar beet yielded fourteen and a half tons per acre. Mr. Hand concludes with the remark, that he should prefer to raise his entire beet crop from the German imported seed, provided he could secure the amount required. I received on the 29th of October, fourteen roots for my examination, which weighed from one pound to four pounds the piece. I selected for my test roots from one to two pounds a piece. The juice of these roots measured 11 degrees by Brix's saccharometer, at 39 deg. F., and showed by Dubosq's polarization apparatus 42.5 deg., which proves that it contained 7.8 per cent. of cane sugar. The French beets showed 9.58 per cent. of sugar.

II. *Report of William H. Pendry, Esq., of Albion, Orleans Co., N. Y.*

The beet roots are raised in a deep sandy loam; carrots have been the preceding crop; clover was grown upon the same land for two years previous to the latter; it was ploughed during the fall before the carrots were cultivated, and received on that occasion twenty loads of horse manure; no manure has since been applied. The seed—one pound—was sown on the 8th of May, 1872, in rows about twenty inches apart. The space between the rows was kept clean by hoeing. The roots were harvested November 18th, and the yield was one hundred bushels, at an expense of five dollars for cultivation. Owing to the drought, or some other cause, many of the seeds did not come up; had the rows been full, the yield would have been one-third more. I received, November 15th, six roots, packed in the soil in which they had been raised. Their weight differed widely; some weighed from one pound to two pounds, whilst others varied from ten to fourteen pounds. The forms of the large and small specimens were equally characteristical and good; the crowns in both cases were, comparatively speaking, small. As these roots differed so widely in size, it seemed to be of particular interest to make two separate tests, and to illustrate once more the *relative value of large and small beet roots for the manufacture of sugar*. I tested first a root which weighed above ten pounds; the juice showed 14 degrees on Brix's saccharometer at 62 degrees F., and contained, according to Dubosq's polarization apparatus, 9.7 per cent. of cane sugar. I subsequently tested the juice obtained of two roots weighing, respectively, one pound and six ounces, and two pounds the piece; its specific gravity measured, at 62 degrees F., not less than 18 degrees by Brix's instrument, and the polariscope showed the presence of 15.1 per cent. of cane sugar. The difference in the percentage of sugar proved thus, in the *present instance*, to be *not less* than 5.6 per cent. (of sugar) *in favour of the smaller roots*. The large beets *could not* be worked for *the manufacture* of sugar *with any prospect of satisfaction, while the smaller ones are of superior quality for that purpose.*

III.—*Report of Mr. Frank Bowen, farmer upon the Thorndale farm of Mr. Edwin Thorne, in the town of Washington, Dutchess Co., N. Y.*

The land for the experiment was a side hill with an eastern slope. The soil consisted of a clayish loam, and was ploughed to a depth of seven inches. Trenches were opened with the plough, and a liberal supply of rotten sheep manure filled in. Two furrows subsequently turned together covered the manure, forming ridges upon which the seed was planted. These ridges ran north and south, and were twenty-eight inches apart. The preceding crop was corn; some twenty waggon loads of green manure per acre had been applied previous to the planting of the corn. The soil was ploughed three times, and several times harrowed before planting the beet seed, which took place on the 18th of May. The roots were pulled on the 6th of November. I received, on the 20th of November, six roots, carefully packed in the moist soil in which they were grown; they varied in weight from five pounds to one pound a piece. I tested only those weighing between one and two pounds. The juice obtained from them measured 14 degrees by Brix's saccharometer at 50 degrees F., and contained 10.97 per cent. of cane sugar.

IV. *Report of James L. Ingalsbe, Esq., of South Hartford, Washington Co., N. Y.*

The soil planted with the seeds of the German sugar beet was a gravelly loam, which was richly manured with stable compost, and ploughed twice previous to planting. The preceding crop consisted of mangolds and Lane's sugar beets, and the yield had been large. The seed was sown in a seed-bed, May 18th; many seeds failed, and the young plants were not fit for transplanting before the 23d of July, when they were transferred to the field. Upon the same piece of land and under the same treatment were also cultivated other varieties of sugar beets. The German sugar beet seed, which served in the previously described experiments, yielded 833 pounds of roots from 198 yards of land. The Silesian sugar beet seeds, supplied by the National Department of Agriculture, yielded, upon the same area, 800 pounds; and Lane's American sugar beet, 798 pounds. The root crops have been generally a failure in the vicinity of South Hartford. Upon one field of two acres, there could scarcely be found one specimen which did not appear as having been gnawed by mice in in some stage of its growth. The roots sent by Mr. Ingalsbe varied in weight from five and a half pounds to one pound and six ounces the piece. They were received on the 25th of November. I tested, as usual, only those weighing from one to two pounds. The juice obtained from them measured 15 degrees by Brix at 56 degrees F., and contained 11.70 per cent. of cane sugar.

V. *Report of Wm. M. Holmes, Esq., of Greenwich, Washington Co., N. Y.*

The land used for the experiment was a sandy loam (inclined to be sandy); the substratum consisted of sand. The seeds were soaked before planting, and they were laid into furrows upon ridges covering trenches filled with but little rotten manure. The preceding crops, potatoes and carrots, had been very satisfactory. The young sugar beets suffered considerably from worms, when about one inch high, but sixty bushels of roots were gathered from one-quarter of one acre. The specimen roots sent for examination varied in weight from two and a half pounds to one pound and two ounces apiece. The juice obtained from them measured 12° by Brix at 62° F., and contained 9.5 per

cent. of cane sugar. Yellow Globe beets, raised under identical conditions, contained in their juice 7.5 per cent. of sugar, and measured 9° by Brix.

VI. Harris Lewis, Esq., of Frankfort, Herkimer Co., N. Y., sent late in the season, December 25th, a lot of beet roots raised from the same seed, which served in the previously mentioned experiments. No report regarding the course pursued in their cultivation has been received. The roots (12 to 13), weighed from four and a half pounds to one pound and six ounces, respectively. They arrived in a *frozen condition*, and furnished thus a good chance to study the effect of frost on sugar beet roots, as far as their qualification for the manufacture of sugar is concerned. I kept them in a frozen condition for several weeks before ascertaining their saccharine quality and industrial value. Frozen beet roots, on account of their large percentage of water, are readily crushed. The colour of the crushed and still frozen root mass was unaltered and normal; in thawing the pulp, a rapid change in colour took place. The juice resulting was of a highly reddish tint. Yet it behaved well in the process of defecation. It measured 13° by Brix's instrument at 54° F., before its defecation, and showed still 11.5° by Brix's saccharometer after it had passed through that process. The amount of sugar present was about 11.0 per cent. Mere freezing had thus apparently not caused a serious deterioration of the roots as far as the condition of the main portion of the sugar was concerned. Yet the rapid change which took place, whilst thawing, does not recommend the process of freezing as a suitable means to preserve the roots for manufacturing purposes.

To aid in a due appreciation of the analytical results of my examinations of the roots, I have arranged subsequently the various observations in a tabular form, beginning with those which contained the smallest amount of sugar:

	Brix's Saccharometer.	*Percentage of sugar in the juice.*	*Percentage of all foreign substances (non-sugar) in solution.*
No. I, Hand,	11.0 degrees,	7.76 per cent.,	3.24 per cent.
No. V, Holmes,	12.0 "	9.50 "	2.50 "
No. III, Thorne,	14.0 "	10.97 "	3.03 "
No. VI, Lewis,	13.50 "	11.00 "	2.50 "
No. IV, Ingalsbe,	15.0 "	11.70 "	3.30 "
No. II, Pendry,	18.0 "	15.1 "	2.90 "

As the fitness of the beet roots for the *economical* manufacture of sugar does not exclusively depend on a certain percentage of sugar (11 to 12 per cent.), but also on the condition under which the latter is present in the juice, I have stated below my analytical result with reference to the relative proportion of the cane sugar and the foreign organic and inorganic substances in solution. The larger the amount of the latter in the juice, the more expensive is the separation of the former. Practical experience tells that the juice of the sugar beet ought not to contain, under ordinary circumstances, more than from 19 to 20 parts of foreign matter to every 100 parts of cane sugar.

		Parts of sugar.		*Parts of foreign matter.*
No. I, Hand,	contains	100	to	41.75
No. IV, Ingalsbe,	"	100	"	28.20
No. III, Thorne,	"	100	"	27.60
No. V, Holmes,	"	100	"	26.31
No. VI, Lewis,	"	100	"	22.72
No. II, Pendry,	"	100	"	19.20
No. II, large roots,	"	100	"	46.20

In studying these tables from the standpoint just explained, we learn that in one instance only, namely, the smaller roots from experiment No. II, has been raised a root of a superior quality for the manufacture of sugar. Experiments No. IV, VI and III have yielded roots which contain a fair percentage of sugar, yet the amount of foreign soluble matter present is much larger than desirable in the interest of a pecuniary success of the manufacture of sugar. Having recognized these facts, it seems but proper to inquire into the cause or the causes which brought about the great differences noticed in the composition of the roots, from the various experiments. As in one case, at least, a root of a superior order has been raised from the seeds of one and the same package, we have to conclude that the seed cannot have been the cause of the varying results. Judging from the reports of the cultivators, we must acknowledge that no extremes of soils have been used in the experiments, and that we consequently may assume, with some propriety, that the alleged unfavourable season has affected all experiments in a similar direction. The mechanical condition of the soil must have been in most, if not in all cases, quite favourable to the experiment. Conceding these points, it seems quite certain that the course pursued in the manuring of the soil, and the time of applying large quantities of barnyard manure, or highly nitrogenous commercial fertilizers, are the main causes of the unsatisfactory composition of most the roots raised. The late history of a successful cultivation of special crops for certain industrial purposes suggests the previous assumption, and the well established experience of successful cultivators of the sugar beet root for *sugar* manufacture, leaves scarcely a doubt about the correctness of my conclusion. It is a well recognized fact that the successful cultivation of the beet root for the *economical* manufacture of sugar does not entirely depend on a careful selection of seeds, but also on a distinct mode of manuring. To produce a root which contains the largest possible amount of sugar in the presence of the smallest amount of other soluble organic and inorganic substances must be the controlling idea of its cultivator. First, quality, and then quantity of roots, for without a desirable quality of the latter it is ruinous to attempt the manufacture of sugar. Experiment No. II gave the most satisfactory result because the circumstances under which it was carried on corresponded more closely than those of any other one with the rules which a sound experience has proved to be essential for the success. These rules are: select a deep, mellow soil (sandy loam), in a good state of cultivation, manure it well with stable manure before planting the *preceding* crop, making thus the sugar beet the *second* crop, after that treatment; and apply, late in the autumn or early in the spring which precedes the planting of the sugar beets, as a special fertilizer for that crop, a mixture of from 250 to 300 pounds each, kainite and superphosphate of lime, per acre. This mode of manuring prevents an unusual accumulation of half decayed vegetable and animal matters, which are known to affect seriously the composition of the roots. Soil and season may modify that influence, within certain limits, yet they cannot prevent it entirely.

Mass. Agricultural College, Amherst, April, 1873.

EXECUTIVE MEETING.

May 9, 1873.—Present, the President, Vice-Presidents Wing, Thorne, Doncaster, Curtis, Geddes, the Corresponding Secretary, Messrs. Thayer, Lewis, Holmes, Cocks and Manley, of the Executive Committee, and Ex-Presidents Campbell, Ingalsbe and Conger.

The Secretary presented a letter from Mr. Tucker, resigning the office of Treasurer of the Society, as follows:

ALBANY, *February* 3, 1873.

My dear Sir—I desire to present, through you, to the Board, my resignation as Treasurer of the Society. As you are already aware, owing to the constantly increasing pressure of other engagements upon my time and attention, I had been previously inclined to contemplate this action, which the recent death of my father renders absolutely imperative.

The position has brought with it many very pleasant asso-

ciations during the past fifteen years, and I cannot abandon it, after so long a period of service, without hesitation and regret, although the circumstances are such as to admit of no other conclusion. Very truly yours,

(Signed), LUTHER H. TUCKER.

And on motion of Mr. Lewis, the resignation of Mr. Tucker was accepted, and Mr. Thayer and Vice-President Geddes were appointed a Committee to audit the accounts submitted of the receipts and expenditures since the annual meeting.

The Secretary presented a letter from Mr. Robert J. Swan, resigning the office of Vice-President of the Society, for the seventh judicial district, on account of his intended absence from the country; and on motion of Vice-President Geddes, the same was accepted; and on motion of Vice-President Wing, Mr. James W. Wadsworth, of Geneseo, was elected to fill the vacancy.

Mr. Holmes, executive officer in charge of the department of grain and vegetables, at the Elmira Fair, presented a report of the frauds by two exhibitors, in that department, as follows:

I hereby submit a report as to frauds by exhibitors in Dairy Hall, at the last Fair. On the last day of the Fair it was ascertained that a barrel of large marrowfat beans, exhibited by S. M. Thomas, of Cuba, N. Y., contained one-third beans and two-thirds corn. Mr. Thomas attempted an excuse, by saying his hired man had deceived him, which excuse not being satisfactory, the premium of ten dollars, which had been awarded, was withheld, and Mr. Thomas was given to understand that only sworn, written, statements of himself and others, knowing the facts, would relieve him from censure. Such statements were promised, but have never been received.

Horace Ames, of Moscow, N. Y., practiced deception, in like manner, in three instances, in oats, peas and beans, and had been awarded and paid twenty dollars premiums upon them, which amount was refunded upon demand, without attempt at excuse. The Viewing Committee subsequently distributed the premiums according to merit, throwing out the above entries. Respectfully submitted,

(Signed), WM. M. HOLMES,
Ex. officer in charge of Department.

Whereupon it was Ordered, that Horace Ames, of Moscow, N. Y., and S. M. Thomas, of Cuba, N. Y., be and are hereby excluded from exhibiting at the Fairs of the Society, on account of their fraudulent practices at the Elmira Fair.

The Secretary presented a communication from the Secretary of the Ontario and Livingston Wool-Growers' Association, proposing a new subdivision of the class of Merino sheep, viz.: into (A), sheep bred for fineness of wool; (B) sheep bred for weight of fleece; and (C), sheep bred for length of staple, or delaine wool; and also recommending that there be separate prizes for two-year-old ewes not having had lambs; the proposition being made in pursuance of a resolution of the Wool-Growers' Association, at their annual meeting, in February last, and, on motion, it was Ordered, that the premium list be arranged and enlarged accordingly.

The Secretary presented a communication from Mr. James Vick, seedsman, Rochester, offering a list of prizes, amounting to $150, for flowers grown from seeds purchased of him, and to be exhibited at the Society's Fair of this year; and, on motion, the offer was accepted.

The Secretary presented a communication from Charles H. Porter, M. D., resigning the appointment of Chemist to the Society, on account of his time being fully occupied in the practice of medicines, and

On motion, it was Ordered, that the resignation be accepted, and that the Secretary convey to Professor Porter the acknowledgments of the Committee for the readiness with which he has always responded to the calls of the Society.

On motion of Vice-President Thorne, Mr. William M. Habirshaw, of New York, was appointed Chemist to the Society.

Messrs. Viele, Whitney, Van Heusen and Church, of Albany, appeared before the Committee, as a delegation from the subscribers to the fund for establishing an Agricultural Association, at Albany, and asked for a proposition as to the terms upon which the Fair could be held this year at Albany, provided there should be a sufficient sum subscribed to justify the undertaking; and after conference on the subject it was arranged that the delegation should return after two hours.

The Committee then proceeded to perfect a proposition on behalf of the Society, and Vice-President Wing, Ex-President Campbell and Vice-President Thorne were appointed a Committee to confer with the Albany delegation.

The Secretary presented letters from Mr. J. F. Converse and from Dr. E. Lewis Sturtevant, one of the Judges of Ayrshires at Elmira, from which it appeared that Brodie, Son & Converse had substituted their reserve animals, Woodville Chief and Lady Pender for Duke of Hamilton and Ayrshire Lass, in their herd shown for the herd prize at Elmira, notwithstanding the animals last mentioned were upon the Fair ground, and exhibited in their respective classes, and from which it also appeared that the infringement of the regulations had not been noticed by the officer in charge of the department, nor by the Superintendent, and that the Judges had thus been misled into believing the substitution allowable.

Whereupon it was Ordered, that the award of the herd prize for Ayrshires at the Elmira Fair be referred back to the Judges to report to which entry it should have been awarded, had no such improper substitution been made.

The applications of the New Hampshire State Board of Agriculture and of the New Jersey State Library for sets of the Transactions of the Society were granted.

On motion, it was Ordered, that Mr. J. A. Lintner be requested to take charge of the collection of insects in the Museum of the Society, and to improve and increase the same as he may have opportunity, and that a stipend of $150 be given therefor.

On motion of Vice-President Curtis, Ordered, that the scale of points for pigs adopted by the National Convention of Swine Breeders be used, as far as practicable, in judging at the fairs of the Society.

The Committee appointed to audit the accounts of the Treasurer, reported that they had examined the same, and found them to be correct.

On motion of Ex-President Conger, the following resolutions were adopted:

Resolved, That in accepting the resignation by Mr. Tucker of the office of Treasurer, the Executive Committee deeply regret not only the cause which has made this action unavoidable, but the loss from that important and influential position in the Society of one so long and pleasantly associated with the present members of the Committee.

Resolved, That Mr. Tucker has so acceptably and efficiently performed his duties as Treasurer, that it will be a laudable ambition for his successors in that office to emulate the promptness in the discharge of its functions, and exactness in the management of the finances of the Society, which have made his administration a model worthy of imitation.

On motion of Ex-President Campbell, Mr. Adin Thayer, Jr., was elected Treasurer.

On motion of the Secretary, Mr. L. H. Tucker was elected a member of the Executive Committee, in place of Mr. Thayer.

The Committee to confer with the delegates from the Albany Association reported that they had come to an agreement by which the Fair of this year should be held at Albany, upon the grounds of the Association, provided a sufficient guaranty should be given within ten days, and on motion, the terms proposed were approved, and the President, Secretary and Treasurer were appointed a Committee to execute an agreement with the Association upon receiving such guaranty.

Vice-President Curtis and the Secretary were appointed to revise the premium list for pigs.

The following members of the Committee were assigned to the several departments as Executive Officers in charge, viz.:

Cattle, Mr. Wing; Horses, Mr. Wadsworth; Sheep and Swine, Mr. Julland; Poultry, Mr. Curtis; Implements and Machinery, Mr. Geddes; Grain and Vegetables, Mr. Holmes; Dairy and Dairy Apparatus, Mr. Lewis; Fruits and Flowers, Mr. Thorne and Mr. Cocks; Manufactures and Miscellaneous, Mr. Doncaster.

Adjourned.

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VOL. XXIII.] ALBANY, MAY AND JUNE, 1873. [NOS. 5 & 6.

OFFICERS FOR 1873.

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5th district—JAMES GEDDES, of Onondaga.
6th district—ALEXANDER S. DIVEN, of Chemung.
7th district—JAMES W. WADSWORTH, of Livingston.
8th district—WILLIAM H. PENDRY, of Orleans.

Corresponding Secretary—THOMAS L. HARISON, of St. Lawrence.

Recording Secretary—WILLIAM H. BOGART, of Cayuga.

Treasurer—ADIN THAYER, JR., of Rensselaer.

Executive Committee—LUTHER H. TUCKER, of Albany; HARRIS LEWIS, of Herkimer; JOSEPH JULIAND, of Chenango; WHEELER H. BRISTOL, of Tioga; WILLIAM M. HOLMES, of Washington; ISAAC H. COCKS, of Queens; JOHN MANLEY, of Cattaraugus; CHARLES D. MILLER, of Ontario.

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Mechanical and Consulting Engineer—HENRY WATERMAN, Hudson.

Consulting Veterinarian—Prof. JAMES LAW, M. R. V. C., Ithaca.

Chemist.—WILLIAM M. HABIRSHAW, New York.

State Agricultural Rooms.

The Office of the Society is in the Agricultural Hall, corner of State and Lodge streets, Albany; and all communications on business of the Society should be so addressed.

ANNUAL MEETING.

Pursuant to amendment of the Constitution adopted at the Annual Meeting of 1872, the Annual Meeting will hereafter be held on the Wednesday succeeding the third Tuesday of January in each year, at the city of Albany.

Annual Meeting of 1874, January 21st.

New-York State Agricultural Society.

THIRTY-THIRD ANNUAL FAIR.

The Thirty-third Annual Cattle Show and Fair of the New York State Agricultural Society will be held upon the grounds of the Albany Agricultural and Arts Association, near the city of Albany, opening on the

24TH OF SEPTEMBER,

AND CLOSING ON THE

1ST DAY OF OCTOBER NEXT.

The grounds will not be open to the public on Sunday, September 28th.

It has for some time been desired to hold the Fair for a full week, and it is believed that with the extension of the duration a corresponding increase of benefit will accrue to exhibitors, and that the intervention of a Sunday will not be found objectionable, as in most cases exhibitors and their employes have heretofore been compelled to be away from home either the Sunday before or the Sunday after the show.

The grounds purchased by the Albany Association are most suitable, both in soil and surface. The situation is very accessible by steam and horse railroads, and live stock and goods can be received and unloaded at the rear entrance to the grounds.

The plans for the permanent buildings to be erected are such as to afford larger and better accommodation than the Society has ever before been able to offer to exhibitors.

The premium list is now ready, and copies will be immediately sent by mail to all persons who have exhibited within three years past, and to all persons who may apply for them.

EXECUTIVE MEETING, MAY 30, 1873.

Present, the President, Vice-Presidents Doncaster, Curtis and Geddes, the Corresponding Secretary, Messrs. Holmes and Manley of the Executive Committee, and ex-President Ingalsbe.

Letters and excuses for non-attendance were received from Vice-Presidents Thorne and Wadsworth, Messrs. Juliand and Cocks, of the Executive Committee, and ex-Presidents Campbell and Church.

The proposed contract with the Albany Agricultural and Arts Association, for holding the fair of 1873, was presented and approved, and it was ordered that upon the completion of the organization of the Albany Association, the same be executed.

On motion, it was ordered that the Fair be held September 24th to October 1st, both days inclusive.

The committee appointed to revise the premium list for prizes, reported that they were not prepared to recommend any changes therein, which report was accepted.

On motion, it was ordered that a special prize of one hundred dollars be offered by the Society upon the same conditions as heretofore for stallions for general purposes, unless some member shall present a larger sum for that object.

The secretary presented the report of the judges of Ayrshires, at Elmira, to whom it was referred at the last meeting to report to which entry the Ayrshire herd prize should have been awarded, had not one of the exhibitors substituted animals contrary to the regulations, who now award the prize to the herd entered by Frank D. Curtis, of Charlton, Saratoga Co., N. Y.; and, on motion, the report was adopted and the change of the award confirmed.

A communication was received from the secretary of the Entomological Society of Belgium, acknowledging the receipt of the Transactions of the Society for 1869

and 1870; informing the committee that the Entomological Society had voted to send to the New York State Agricultural Society a complete set of their reports; and requesting a set of the Transactions of this Society, or such volumes as can be furnished; and, on motion, it was

Ordered, that the secretary convey the thanks of the Committee to the Belgium Society for the valuable donation, and that a full set of the Society's Transactions (excepting the volumes already forwarded), be sent as requested.

The Committee then proceeded to revise the premium list and regulations, and completed the same.

Adjourned.

ARTIFICIAL MANURES.

LETTER FROM JOHN BENNETT LAWES, ESQ.

ROTHAMSTED, ST. ALBANS, *March* 25, 1873.

HENRY SALTONSTALL, ESQ., *Treas. Mass. Society for Promoting Agriculture:*

DEAR SIR: Dr. Gilbert has requested me to answer your letter of the 21st of January, and to inform you that in accordance with your request, I have forwarded to you through Messrs. Saunders & Co., Liverpool, three tons of super-phosphate of lime. I am very sorry that so much delay has taken place in this matter, but it was found necessary to have the manure packed in casks, and these casks caused delay in the order. I have for some time ceased to be a manufacturer of commercial manures, and therefore had not the same authority as formerly. The manures I have forwarded to you are made entirely from Charleston Phosphate and sulphuric acid. I have selected this substance in preference to our own phosphate as better to prove to you that you have one of the best phosphates which the world produces, but also one which can yield a commercial super-phosphate cheaper than any other. Charleston Phosphate as imported into this country, contains from 57 to 60 per cent. of phosphate of lime, when ground and mixed with sulphuric acid in the proportion of 100 phosphate to about 80 acid it yields a product of 30 to 33 phosphate rendered soluble, and not more than 3 to 4 per cent. insoluble. In your country the phosphate can be raised at a cost of less than 20*s*. per ton, the grinding would cost, at the most, 5*s*. per ton, the acid 50*s*. per ton; in fact the net cost of the super-phosphate, ready to pack in bags, ought not to be more than 40*s*. per ton of 2240 lbs., and all the phosphoric acid should be rendered soluble except 2 or 3 per cent. As these manures are required for experimental purposes, I beg to offer them to the Massachusetts Agricultural Society without charge, and also the following summary, which may be said to comprise the results of my experience and practice in regard to artificial manures for the last thirty years:

The only two substances really required in artificial manures, are:—

1st. Nitrogen.
2d. Phosphate of lime.

Nitrogen is useful in three forms:

1st. As nitric acid.
2d. As ammonia.
3d. As organic decomposable matter, yielding ammonia or nitric acid.

Nitrogen is more valuable in the form of nitric acid than it is as ammonia, and ammonia is more valuable than decaying substances yielding it. The best possible manure for all gramineous crops, wheat, barley, maize, oats, sugar cane, rice, pasture, grass, is a mixture of super-phosphate of lime and nitrate of soda. 300 lbs. of super-phosphate of lime and 275 lbs. of nitrate of soda applied every year to one acre of ordinary English land, has for twenty consecutive years given a produce annually of 6 quarters of barley; 14 tons of farm-yard dung applied annually over the same period, has given the same produce in barley. Super-phosphate of lime is a special chemical manufacture, which can be made cheaper on a large than on a small scale, and therefore farmers ought to buy it cheaper than they can make it, but it is better to make up their own compound manures, purchasing their nitrate of soda or salts of ammonia. It is not advisable to sow artificial manures with beans, peas, tares or other leguminous plants. Corn and root crops will take all the artificial manure which the farmer can afford to pay for. Super-phosphate of lime should always be placed under the soil, either by drilling or harrowing in when the seed is sown. Nitrate of soda may be sown in the same way, or it may be sown broadcast when the crop is up. The increase in the growth of the cereal crop is much more dependent upon the nitrogen supplied than on the phosphoric acid. Potash is generally found in sufficient quantities in soils, and the artificial supply is not required.

J. B. LAWES.

RED RUST IN COLONIAL WHEAT.

In the *Agricultural Gazette* for June 8, 1872, I wrote as follows:—

"The following fact may prove interesting as regards the red rust which is so extensively injurious to the wheat crops in Australia and Canada. A very choice sample of wheat was sent to me from Canada, so, judging from former experience how inferior Colonial wheat results on my farm, I only dibbled it on a part of two lands or stetches in the middle of a field drilled with Golden Drop English wheat. All went on luxuriantly until recently, when the two lands of Canadian wheat showed signs of red rust, and are now a shining red among the green. But they are evidently infecting the adjoining wheat, especially that close to them, and the red tinge is gradually spreading, so that I fear an acre or more may be damaged, and that it may prevent my being able safely to sell the Golden Drop for seed, which I intended to do. The fact is interesting, for we may safely conclude that the disease is in or on the seed, and that it is not so much a question of climate. I should therefore like to know, in the interest of our Canadian or Australian friends, whether they soak or steep their wheat, as we do, in a solution of sulphate of copper or some other dressing. I should imagine that they do not. Fortunately for the cause of comparison and discovery, we did not steep the handful of Canadian wheat sent to us; it is more than probable that if we had done so it would have been free from rust, like the rest of my wheat crops. Those interested in Colonial agriculture will be quite welcome to inspect the crop between this and harvest time."

Since writing the foregoing, the Colonial wheat referred to wasted and became worthless at harvest. The Golden Drop wheat on each side of it was of good quality and unaffected, although the tips of some of the leaves immediately in contact with the Colonial wheat had an orange tinge. I consider it to be of immense importance to our colonies that the farmers there should steep their wheat, and thus avoid rust and smut, for rust especially entails immense losses (see the annexed letter, just received). A comparative trial, with and without steeping, would remove any doubt.

We use 1 lb. of bluestone (sulphate of copper), dissolved in 10 pints of water, to each sack (4 imperial bushels) of wheat. The wheat is either soaked in the solution for ten minutes, or the solution is poured over and intermixed with it until it is absorbed. I have almost invariably found that wheat sent to me from our colonies became rusted and worthless. For the

future I shall steep a part, and leave another part unsteeped. The samples sent to me were of very fine quality.

I should be glad to learn if any of my brother agriculturists have had experience with Colonial wheat, and whether it was sown steeped or unsteeped? I have heard complaints that it requires acclimatising, perhaps that may have reference to the residue of the crop first sown having been steeped.

The following is a striking instance of the necessity for steeping wheat:—We sowed a headland with unsteeped wheat, and the crop of that headland was full of smutty ears. The rest of the crop, from the same seed steeped, was perfectly free from smutty ears. The following is the letter above referred to, together with my answer. They may prove of interest to your readers. *J. J. Mechi, Tiptree, March*, 1873.

"WEST END, VICTORIA PLAINS, WESTERN AUSTRALIA, "*December* 18, 1872.

"Sir,—Not having the honour of your acquaintance, I feel I am taking a liberty in writing to you, but trust the cause of my doing so may be a sufficient apology. We have been suffering from red rust for several seasons past, but this last season has been most fatal. The crops in some parts of the colony are entirely destroyed, and throughout more or less affected, which will, it is feared, completely paralyze the exertions of many, and others totally ruined. Believing your opinion on all farming matters to be the highest authority, and feeling that your advice at this crisis would be of eminent service to my brother colonists as well as myself, I am induced to write to you on the subject, in order, if possible, to discover some means of checking its ravages next season.

"I would also ask your opinion of the following:—

"Whether lime and salt spread on the land would be a likely antidote to rust, and if so what proportion? When should it be used—as soon as the blade comes—just before it spindles—or just before it comes out in ear?

"What lands most subject?

"Is it principally attributable to the weather, in the way of east winds and blighty clouds?

"Are there any means of checking it when at first slightly making its appearance?

"I will not encroach upon your valuable time with further questions, but hoping you will under the circumstances kindly aid us with your counsel, I have the honour to be, sir, your obedient servant.

"J. J. Mechi, Esq." "CHARLES CLINCH.

"TIPTREE HALL, KELVEDON, ESSEX, *March* 6, 1873.

"Dear sir,— I refer you to the foregoing as a reply to your letter. I have had no experience with lime and salt, although I have heard of its being used as a dressing for the seed.

"The sulphate of copper is, as far as my experience goes, a certain preventative. I believe the mischief is in or on the seed. In England, we suffer most with bladder or smutty ears where seed is unsteeped The fine Colonial wheats which I have sown always promise well, and look healthy until the development of the head, and then become destroyed by the rust. In future I shall try a part steeped and unsteeped of any Colonial samples I may receive. I am, dear sir, yours truly. "J. J. MECHI.

"Mr. Charles Clinch."

"In most Buddhist countries, the *Festival of the Plough* is held annually, with great honour, all classes, from the monarch down, paying reverence to this symbol of the dignity of labour. In Siam, on these occasions, a King of the Husbandmen is chosen, who represents the highest authority, and is made the centre of various singular rites. During his brief sovereignty he receives as his perquisite, all fines paid for violating the law against doing work on this festal day."—*Johnson's Oriental Religions*," p. 761.

RAILWAYS AND THE STATE.*

[From the London *Quarterly Review*, April, 1873.]

Safety, economy, and expedition may be said to constitute the *trinoda necessitas* of all travellers by land and by water, of all consignors and consignees of merchandise, and of all who are interested directly or indirectly in our internal communications.

If we have already reached and (which is still more important) secured to ourselves for the future the highest perfection attainable in these three particulars, we have nothing to do but to be thankful for the blessings we enjoy If we have *not*, but are, on the contrary, very far from their attainment, and in danger of losing even what we possess, the practical question arises "By what means, if any, the public interests, in these important matters, may be effectually protected?"

Perhaps we shall be asked, "Why do you complain? Are not the appliances for locomotion as safe, as cheap, and as quick as they ought to be?" The answer to this question must of course depend, in some degree, on the standard aimed it. But a country possessing a manufacturing industry far more productive and expansive than any other in Europe—a country, moreover, which took the lead in railway enterprise—may not unreasonably be expected to be in advance of its neighbours in respect of its internal communications. How, then, do we stand in comparison with other countries in Europe as to the safety, economy, and speed of our locomotion?

1. As to safety. We sometimes hear railway authorities congratulating themselves upon the small percentage of casualties on the gross number of passengers in England; but the question rather is, whether we are improving or deteriorating in this respect. From the Board of Trade returns for 1871, it appears that the total number of accidents was 1665, of which 402 were fatal. It further appears that the cases which have been the subject of official inquiry, show an increase of 30 per cent. over the average of the preceding five years. We possess very imperfect data for comparison with other European countries in this respect; but if we take the percentage of accidents to railway mileage in the United Kingdom, we find that for the year 1871 it was in the proportion of 11 per cent. on the number of miles open, while in Belgium it was not more than 7. On comparative statistics of this kind, however, we place little reliance. The important practical question is, "Does our present system tend to diminish the risks of travelling?" And this question we are compelled to answer without hesitation in the negative. If a certain percentage of casualties is necessarily incident to locomotion, it is surely all-important that in cases arising from criminal neglect the culprit should be easily detected. But so long as every fatal catastrophe is followed by a mysterious controversy about "inter-locking points," "block signals," and "level crossings," between the authorities of the Board of Trade and railway companies, the representatives of the killed and

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*1. Report of the Joint Select Committee of Lords and Commons on Railway Companies' Amalgamation. Session 1872. Parliamentary Paper.
2. "Railway Amalgamation." A speech delivered by R. S. Graves, M.P., at the Annual Meeting of the Liverpool Chamber of Commerce, 26th January, 1872. London, 1872.
3. The Amalgamation of Railway Companies, or the Alternative of their Purchase by the State considered. By Robert Benson. London, 1872.
4. "The Appropriation of Railways by the State," a Popular Statement, with a Map. By Arthur John Williams, of the Inner Temple, Barrister-at-Law. London, 1870.
5. Observations by Sir E. W. Watkin at the Meeting of the Manchester Chamber of Commerce, May 13, 1872. Manchester, 1872.
6. Speech of the Right Honourable Chichester Fortescue, M.P., in the House of Commons, on introducing the Railway and Canal Traffic Bill, on the 16th of February, 1873.
7. The State Purchase of Railways. A paper read before the Statistical Society, by Mr. R. Biddulph Martin, on Tuesday, March 18th, 1873.

wounded will probably ask in vain, "Who ought to be hanged?" And in the face of legislation directly tending to aggravate all the evils of this double government, and the difficulty of fixing the responsibility for accidents, no one at all conversant with the facts of the case will deny that whatever marvels we may have accomplished in the matter of locomotion, adequate guarantees for the public safety yet remain to be provided.

2. With respect to the second question, that of economy, a table of comparative fares and rates, drawn up by Mr. Galt (the figures of which were substantially verified by the report of the Royal Commission of 1866), gives the following results:

Average fares charged to first-class passengers for a journey of 100 *miles in the twelve countries of Europe enumerated below.*

	£.	s.	d.
In Belgium	0	6	6
" Italy	0	10	6
" Spain	0	11	9
" Prussia } " Denmark } " Austria }	0	13	0
" France	0	13	4
" Norway	0	13	4
" Switzerland	0	13	6
" Holland	0	14	0
" Portugal	0	14	2
" Russia	0	14	5
UNITED KINGDOM	0	18	9

It may be added that a comparison of the second and third-class fares shows the same results proportionally, while the goods' traffic rates charged in Belgium present a still more striking contrast with those on English railways. The following examples of the contrast are given by Mr. Williams in his "Popular Statement":

"The charge for carrying raw silk from Derby to Manchester (69 miles) is 2*l* 10*s*. per ton; according to the Belgian rate it would be 9*s*. 3*d*. From Derby to Glasgow (275 miles) the rate is 5*l*.; according to the Belgian rate it would be 1*l*. 1*s*.

"The charge for carrying groceries between London and Bristol is 23*s*. 4*d*. per ton. In Belgium it would be 18*s*. 9*d*.

"The cost of carriage for sugar from Liverpool to Worcester (100 miles) is 16*s*. 8*d*. per ton. In Belgium it would be 12*s*. 1*d*.

"Butter is carried from Liverpool to Manchester (32 miles) at the rate of 10*s*. per ton; according to the Belgian tariff it would only be 4*s*. 10*d*.

"From Burton-on-Trent to Winchester (194 miles) the charge for ale is 26*s*. 8*d*. per ton. In Belgium it would be 17*s*. 6*d*. To Newport (136 miles) the charge is 21*s* 8*d*. per ton. By the Belgian tariff it would be 14*s*. 6*d*."

Changes are of course made from time to time in both tariffs, but, according to Mr. Williams, they still present a striking contrast in the charges for the following bulkier commodities:

"The cost of carrying a ton of timber or deals from Liverpool to Dewsbury (65½ miles) is 12*s*. 6*d*. If we had the Belgian tariff, it would only cost 5*s*. The cost of carrying a ton of timber from Liverpool to Manchester (31¼ miles) is 8*s*. In Belgium it would only be 3*s*. 1*d*. From Liverpool to Stockport (38 miles) the charge is 10*s*. per ton. The Belgian charge would be only 3*s*. 8*d*.

"Bar-iron is carried from Wolverhampton to Southampton (152 miles) at a cost of 19*s*. 2*d*.; in Belgium it would be carried for 9*s*. a ton. Pig-iron can only be brought from Wolverhampton to London (126 miles) at an expense of 15*s*.; according to the Belgian scale it would be 6*s*. Between London and Bristol the rates for hardware are 27*s*. 6*d*. a ton; on the Belgian scale they would be 13*s*. 6*d*. The manufacturers of earthenware at the potteries have to pay at the rate of 30*s*. per ton for the carriage of their goods to London (150 miles); the Belgian railways would carry them for 9*s*. Grain is charged 12*s*. 6*d*. a ton from Liverpool to Sheffield (74 miles); the Belgian rate would be 6*s*. 11*d*."

As to the advantages of uniform terminal charges and published rates on various Continental railways, valuable information is furnished by the evidence of Mr. Malcolm before the Joint Select Committee of 1871. But enough has been said to prove the shortcomings of England as to *economy* in railway traffic.

3. With respect to the third point of comparison, namely, speed, in which great superiority has been sometimes erroneously claimed for English locomotion, it will be found that the difference between ourselves and our neighbours is not very considerable. The average of all the English examples of the quickest trains, given in the appendix to the report of the Royal Commission, gives a speed of 36¼ miles per hour. The average of the quickest examples in France is given at 31, while the quickest of all (that between Paris and Rouen) is 36. In Belgium, the quickest are from 29 to 35; in Prussia, 29; in Austria, 20 to 29; in Bavaria, from 24 to 32; in Italy, from 24 to 30 miles per hour.

It appears, therefore, that Englishmen can travel, at a greater risk of life, and at considerably higher cost in money, about five or six miles an hour faster than their Continental neighbours. It may be added that a first-class passenger may often engross two seats for a single fare, and travel in a half empty carriage, at almost any hour of the day he pleases, to his destination on any of the leading thoroughfares of England. For schoolboys, going home for their holidays, to whom "money is no object," and safety of much less importance than expedition, this state of things may be very satisfactory. But to the grown-up community, who, though they might be content with the *status quo*, foresee that they will soon be at the mercy of a few colossal companies as to speed, safety, and cost, the aspect of affairs is not so bright; and they naturally ask themselves how it comes to pass that England, with all her vaunted enterprise and skill, has not only drifted to leeward of her European neighbours in all the essentials of good internal communications, but is even in peril of being more completely distanced in the race?

The cause of our deficiencies is not far to seek, and if its investigation may stimulate our efforts to redress them and (if we cannot repair what we have lost) to take such securities as we can against still more serious evils for the future, the inquiry will not be altogether in vain.

The oft told and disastrous tale of British railway enterprise scarcely needs to be repeated. Suffice it to say that during less than half a century we have constructed nearly 16,000 miles of railway, at an expense of 550 millions sterling, and at an average cost per mile nearly double that incurred in similar works by any country in Europe. It may be added that on more than 50 millions of the above-named capital, the proprietors receive no dividend at all. That the community at large should have to pay in some shape or other an eventual penalty for the recklessness which it has tolerated, and even encouraged, is, of course, inevitable. Ruined shareholders cannot possibly be the only sufferers in a collapse affecting the highways of the country, which, by whomsoever constructed, "belong or ought to belong," in the language of a high authority, "to the people just as much as the light of heaven." Under the haphazard system which prevailed through the first era of railway enterprise in this country, any penniless adventurer who could satisfy the Standing Orders of Parliament by a temporary deposit, was able to start a new railway side by side of an existing line, which, after crippling its own

powers of accommodating the public by costly litigation, was often doomed finally to buy up its sham rival with money which would have been otherwise applied to the improvement of the communications of the whole district. And this was called "healthy competition," and under that plausible designation imposed both on Parliament and the public, until its inevitably ruinous consequences, not only to the deluded shareholders, but to the community at large, became at last too painfully obvious. And so it came to pass that when by a costly and wasteful process a rapid and ill-organized extension of our railway system had been in a blundering and unsatisfactory manner accomplished, and the various competitors for the privileges of "common carriers" discovered too late the mistake they had made, devices of all kinds were resorted to for the mutual protection of the rival companies from the perils of the headlong race they had embarked in. Then came the era of "working agreements," "through booking," "joint-purse arrangements," "division of traffic," "running powers," &c., which were all so many contrivances for undoing the work of Parliament, and attaining outside its walls the results of legislative amalgamation. Meanwhile the action of the Executive Government presents a constant series of well-meant but abortive attempts sometimes to regulate, sometimes more actively to control, in the presumed interests of the public, the excesses of railway enterprise. Of these the most conspicuous were Sir Robert Peel's in 1840, Lord Dalhousie's and Mr. Gladstone's in 1844, and the constitution in the same year of the Railway Department of the Board of Trade. In 1853 came the Committee of which Mr. Cardwell was chairman, and from which the Act which bears his name resulted in 1854; previous to which a large number of speculative schemes, comprising no less than 2,000 miles and £40,000,000 of capital had been abandoned without consent of Parliament.* Then came the Royal Commission, over which the Duke of Devonshire presided, in 1866, and finally the Joint Select Committee of Lords and Commons in 1871, on the recommendations of which Mr. Chichester Fortescue, its chairman, bases the Bill which is now before Parliament.

For thirty-three years the chief apparent object of Parliamentary intervention has been—first, by encouraging the competition of highways and canals with railways, and afterwards that of railways between themselves, to protect the public from the dangers of monopoly, and at the same time to create some central authority by which the growing independence of the railway interest might be regulated and controlled.

In both these objects Parliament has signally failed, for though all its machinery of Committees and Commissions has been brought to bear upon the question, we are at this moment in the presence of a monopoly far more formidable than that to the dangers of which we have on two previous occasions adverted in this Review,† while the impotency of all contrivances for controlling the action of railway companies daily increasing in power, as by combination they diminish in number, is too obvious to need illustration.

The main question therefore is, not whether we are to be satisfied with what we possess, whether our present appliances are as good as the ought to be, but into what state of things we are inevitably *drifting*. The Joint Select Committee of last Session, whose Report affords a masterly and complete summary of the history of railway legislation, concludes with these remarkable words, which may serve as a warning to those who are sanguine enough to anticipate any grand

* See Report of Committee of 1853.

† "Railway Legislation," in "Quarterly Review," vol. lxxiv, July 1844. "The Great Railway Monopoly," "Quarterly Review," vol. cxxv. October 1868.

or important result from any Act founded on that Report:

"If the above recommendations are adopted by Parliament, they will *not* have the effect of preventing the growth of railway monopoly, or of securing that the public shall share by reduction of rates and fares in any increased profits which the railway companies may make."

In other words, a Committee composed of twelve of the ablest men in Parliament, who have examined some fifty experienced witnesses, including all the leading railway managers, and have studied the past history and present aspects of the question, deliberately assure us that they have no remedy to suggest for evils which the evidence brought before them proves to be serious, and no security against dangers which they admit to be imminent.

We have no desire to undervalue the labours of the Committee, or to depreciate the Act which it is proposed to found on its recommendations; though some of the clauses of the latter are so irritating and unfair that it is difficult to imagine that they can ever become law. But it would be an exaggeration to regard the Report of the Bill as anything more than a repetition in 1873 of the proposal which proved nugatory in 1854; for whether the Mixed Tribunal now proposed may prove better or worse for its purpose than the Court of Common Pleas, all the infirmities of the old scheme are inherent in the new one.

After more than a quarter of a century's experience, we know pretty well what the Railway Department of the Board of Trade (by whatever name we may call it) is likely to effect. It is not very probable that Mr. Chichester Fortescue and his colleagues will accomplish now what Lord Dalhousie, with greater vigour and weaker antagonists, failed to accomplish in 1845. The only result of such a "double government"—try it in any form we please—must be divided responsibility, increased danger to the public, and after a brief and ineffectual struggle on the part of the executive, a final triumph for the railway interests.

By the common consent of all practical men, competition—the ordinary safeguard of the public in matters of trade—has ceased to afford the slightest protection (except in the few unimportant cases of rival sea traffic) against railway monopoly. And as for canals, the recent purchase of the Bridgewater Canal on behalf of railway interests does not encourage the sanguine hopes of those who may have relied on effectual competition from that source. In fact, railways are now admitted to be what they have in fact been from the first—industrial monopolies.* And as the death of competition happens to coincide with a peculiarly vigorous and irrepressible phase of combination, that portion of the public who take thought for the morrow is not unnaturally beginning to ask itself by what means we can secure the continuance of whatever accommodation our present internal communications may afford.

The crisis at which we have arrived is forcibly and accurately described in the two following conclusions, which the Joint Select Committee of 1871 embodied in their Report. They sum up the history of Parliamentary inquiry and legislation as follows:

"(1.) That Committees and Commissions carefully chosen have, for the last thirty years, clung to one form of competition after another; that it has, nevertheless, become more and more evident that competition must fail to do for railways what it does for ordinary trade, and that no means have yet been devised by which competition can be permanently maintained.

"(2.) That, in spite of the recommendations of

* See "Quarterly Review," vol. cxxxi., October 1871.

these authorities, combination and amalgamation have proceeded, at the instance of the companies, without check, and almost without regulation. United systems now exist, constituting, by their magnitude and by their exclusive possession of whole districts, monopolies to which the earlier authorities would have been most strongly opposed. Nor is there any reason to suppose that the progress of combination has ceased, or that it will cease until Great Britain is divided between a small number of great companies. It is, therefore, of the utmost importance that the actual facts should be clearly recognized, so that the public may become acquainted with the real alternatives which lie before them."

If the conclusions of the Committee are correct, the country will have to choose between two alternatives, either to accept combinations between companies until the entire railway system is in the hands of four or five independent and colossal corporations, or to adopt means for railways becoming the property of the State. For, whatever may be the practical effect of the measure now before Parliament, nobody supposes it will stop amalgamations of railways. Let Parliament do what it may, these combinations will inevitably go on. "For," says Mr. Graves, "the railway history of England is but one long list of absorptions and amalgamations. In 1866, out of 13,950 miles of railways belonging originally to 353 companies, 12,221 miles were actually worked by twenty-eight companies. The 'Lancashire and Yorkshire' has reached its present dimensions after five or six amalgamations, while the London and North-Western probably embraces thirty more." It may be added that the North-Eastern Railway is now composed of thirty-seven combined lines, formerly competing. In the face of these facts, it is idle to suppose that the gradual consolidation of our railway system, into some half-dozen large groups can be materially affected or delayed by the action or inaction of Parliament.

The dread of State intervention with private enterprise — an apprehension which assumes sometimes healthy and sometimes morbid forms—has, no doubt, contributed to disincline Englishmen from following the example which the successful experience of many Continental nations might have otherwise led us to adopt. But the possible necessity of such an alternative is no new idea. It has long been present to the minds of our most far-sighted statesmen. So long ago as in 1844, when Mr. Gladstone's Bill, empowering the Government to purchase, after the lapse of twenty-one years, all railways which should in the intervening period be constructed, was passing through Parliament, Sir Robert Peel, though declining to advise the *immediate* purchase of railways, used these words: "Seeing that there is a monopoly with respect to conveyance and communication, the Legislature should have the power of purchasing, after a certain period, on giving due notice to the parties concerned. We are about to say to the railway companies, *You shall not have a permanent monopoly against the public*, but after a limited number of years, we give you notice we shall have the option of purchasing your property."

Such language, from one of the foremost advocates of non-intervention with private enterprise, affords to us now, thirty years afterwards, an indication of the policy which Sir Robert Peel, and those who acted with him, then foresaw would sooner or later become inevitable.

Five years ago, in commenting on the report of the Royal Commission on Railways then just issued, and especially on the supplementary Reports of Sir Rowland Hill and Mr. Monsell* we ventured to predict that the views set forth in these last-named documents would, sooner or later, meet with increased acceptance from the public. Intervening events have only tended to strengthen this impression, and notwithstanding the serious obstacles of self-interest, and of prejudice, which have yet to be encountered and overcome, the disposition calmly to consider the alternative of State management in this department of national affairs grows with the dangers, which every other proposal offers, in daily aggravated form. Captain Tyler, who has the benefit of some twenty years' experience as an inspecting officer of the Board of Trade, has aided so materially in enlightening public opinion on the present aspect of the question that we cannot do better than quote the words in which he concludes a valuable Report presented to the Board of Trade in November, 1871.

"At a time when combination has already proceeded in the railway system to great lengths, and when further combination, of which the ultimate end will be complete monopoly, is proposed, it is desirable to consider seriously the means of control in the interest of the general public which it will be possible to provide. In considering the question in all its bearings, by the light of past experience, and with the knowledge that further control could not be exercised without detailed interference in railway working, it is apparent that, practically, there is the choice between only two courses. Inasmuch as *dual* management would be destructive to efficiency, and would only tend to constant difficulty and dissatisfaction, the future monopolies must either be managed by the State in the interest of the general public, or must be managed by the directors of the monopolising companies in the interest of their shareholders, with such advantages to the general public as they might consider it expedient to afford. And in those respects in which the public advantage did not coincide with the supposed interest of the companies, the public would have to do the best they could with the facilities which were granted to them. The management of railways by companies in the past has not been such as to justify the belief that as the companies become more powerful, and therefore more independent of control, it will be wise to entrust to them greater influence and still more completely the important interests of the means of conveyance throughout the country. Company management has in the past been sometimes disastrous, frequently inefficient, constantly wanting in the means of properly conducting its business and of securing safety, and occasionally dishonest. State management, ably administered, would be more economical and more efficient, and would have no possible object than the common good. * * * * Considerable and general reductions and equilisations of rates and fares, which could not be expected from directors working, in the interests of their shareholders at the most paying figures, for a maximum of profit, would naturally and easily be carried out under State management. And the vast accession of traffic which would result would, besides yielding a fair return on the capital guaranteed, afford an unparalleled stimulus to the manufacture, commerce, and general prosperity of the country. Unity of management in the hands of the State would thus be of enormous advantage to the country as regards economy and facilities of communication, and it would further be attended with many incidental advantages in connection with the postal and an improved parcel service, with the conveyance of troops, with the employment and instruction of a portion of the army in railway work, and with the organization of the railway stations throughout the kingdom under Government officers and servants, as the great centres of intercourse, information, and traffic. It is difficult under all these circumstances to avoid the conclusion that the question of the acquisition of the railways is one which is at least well

* Mr. Monsell's Report alludes almost exclusively to the assumption by the State of Irish railways, which embrace a capital of 27 millions, and a mileage of 2000 miles.

worthy of the serious consideration of Her Majesty's Government at the present time."

The State management of railways formed no part of the inquiry undertaken by the Joint Select Committee of 1871. It is, therefore, only incidentally that the Report throws any light on the subject. It must not, however, be supposed that the arguments for the views put forth by Captain Tyler rest on "official crotchets," or the Utopian dreams of unpractical theorists. In the publications the titles of which are prefixed to this article, we find the deliberately recorded opinions of disinterested gentlemen of long railway experience, whose views on this question cannot lightly be dismissed. Among these may be enumerated Mr. Graves, the late member for Liverpool, whose untimely death has inflicted a severe loss, not only on his constituents, but on the commercial world, and whose evidence, it may be added, is that of a witness conversant with the interests of which he speaks, as a leading director of the largest railway in the United Kingdom. In addressing the Liverpool Chamber of Commerce, so recently as in January, 1872, Mr. Graves, after adverting to the pending amalgamation of two great railways, went on to say:

"If Parliament should find itself unable to provide adequate security against the increasing powers of the railways, then we are brought face to face with the only alternative which remains—an alternative for which, I fear, the public mind is scarcely yet prepared—the transference in some shape or other of the highways of the country to the control of the State.

"I know that there is a traditional antipathy to the State undertaking anything in this country that private enterprise can do as well, and as a general principle, this is sound; but the railways of a country involve ground for peculiar, if not exceptional, considerations, inasmuch as they are practically our highways; they are gradually but surely superseding all other modes of communication; they have exercised the greatest influence in raising the country to its present remarkable state of prosperity; and they have become so identified with the success of every interest in the country that we can no longer shut our eyes to the fact that on the good or bad administration of our railways largely depends the welfare of the nation. If we could eliminate all private interests from their management, and allow the administration to consult about the public good—to do for persons and for goods what we have done for letters and for telegrams—the State would possess in its own hands the means of extending benefits immeasurably greater than have ever been conferred by either one or the other.

"Let us suppose for a moment that the whole of the railways of the country were one interest, worked solely for the public good, that the missing links which now keep our great systems apart were dropped in, the shortest routes selected for through traffic; that in place of opposing trains running half empty to the same localities at the same hours, they were separated and made more frequent; that the public participated in the saving which would result from unity of control, the cessation of Parliamentary contests, and many other advantages which could be named—surely such would be a great improvement on the costly separate systems now in force; but if we add the financial saving which would annually result were the State to become the borrower, we shall arrive at a correct impression of what might be done by a colossial amalgamation, in which the interests of the nation would alone have to be consulted."

After going into some interesting financial details, which prove that Mr. Graves had not lightly taken up this important question, he thus concludes:

"There are many advantages which, if time permitted, I might show would accrue to the State from State control. Besides cheaper and more uniform rates, and the utmost possible facilities for free and regular intercourse, it would solve the question of workmen's trains in all our great centres of industry; it would enable the Post Office to greatly enlarge its operations; it would enable us to extend to parcels the principle applied to letters; it would provide a very practical field for the industrial employment of our army; and it would enable us to see how far low rates would stimulate traffic, and whether it was not more profitable to carry the many at cheap rates than the few at high rates."

In adverting to the recorded opinions of what may be called the "railway authorities," who have ranged themselves on the same side with Mr. Graves, we desire to call special attention to the able and important pamphlet of Mr. Benson, an influential director of the London and North-Western Railway Company, who has, we are informed, taken an active part in railway administration for no less than thirty-five years. From this pamphlet we shall have occasion to quote presently; but, meanwhile, we will refer those who wish to hear both sides of the question to a speech delivered before the Manchester Chamber of Commerce in May last, by another railway director, who is actively connected with the management of several lines. Of Sir E. Watkin's speech, which reproduces vigorously all the stock arguments against all State intervention, we will only remark that his application of these arguments to railways mainly consists in deprecating the extinction of competition, which, by the common consent of all men, is, so far as railways are concerned, for all practical intents and purposes, extinct already. But it would be romantic to expect that the great railway potentates, whose empires yield in some instances a gross revenue almost rivalling that of a first-rate European power, should at once welcome an organic change of government, which cannot increase, and may possibly inperil their importance. Still less will such a revolution approve itself to the less important members of the railway boards. Of the 2500 directors who are now supposed to manage the railways of the United Kingdom, at least two-thirds would probably be disestablished by the proposed change, and cannot, therefore, be reckoned on as its supporters. The same remark applies to the lawyers who conduct the litigation of railway companies, both in and out of Parliament, and perhaps also to the bankers who have the custody of their funds.

The stock objections to State management of railways, which are, in fact, the same which have been successively paraded against the State management of the Postal Service and the Telegraphs, resolve themselves into three classes, which may be called the Political, Administrative, and Financial objections.

They may, perhaps, be stated as follows:—

1. Would not the amount of patronage placed at the command of Government be objectionable in a constitutional point of view?

2. Could railways be administered, managed and worked by the State?

3. Might not the absorption of the railways by the State, or the purchase by Government on its behalf, prove to be a losing operation in a financial point of view?

The two first-named classes of objections, namely, the Political and Administrative, so constantly overlap each other that they may, perhaps, be most conveniently treated together. Those which are distinctly political (which, however, the experience of almost every State in Europe has already refuted) take various forms, but the "awful consequences of leaving a service so vast, numerically, at the mercy of State patronage," form the most popular topic with these reasoners. The "State" is, for the purposes of their

argument, represented as an irresponsible despot, foisting his incapable favourites into highly paid offices, and smashing his subjects under murderous locomotives; and it is suggested that all this nepotism and wickedness may be perpetrated without remedy on a helpless community, which will have lost all power of appeal or of redress. But why, we ask, are all complaints to be silenced because traffic managers, instead of being servants of a money-making company, are servants of a Government responsible to public opinion? Is it likely that the old ladies of both sexes, who pour forth their daily troubles to the "Times," about "leaky foot-warmers," "extortionate porters," "draughty stations," "fossil sandwiches," or "unpunctual trains," will be reticent because the head of the Railway Department is a responsible Minister of the Crown? On the contrary, is it not more likely that half the complaints and accidents which are now hushed up will be brought to the light of day? But it is said—and it is supposed to be a crushing answer to all hints at the State management of railways—"A railway accident may upset a Government!" To which we would answer, "Why not?" Is it not as worthy a cause for such a catastrophe that half a hundred lives have been sacrificed by recklessness or parsimony as that some colonial official has made a political blunder at Hong Kong? If, for the now helpless and powerless President of the Board of Trade, whose function it is to scold and to advise disobedient subjects sufficiently independent to scorn his lectures and disregard his admonitions, you substitute a real Minister, endowed both with power and with responsibility, his position as to the internal communications of the country would be precisely the same as that of the other Chief Secretaries of State in their respective departments; nor would his administrative difficulties be necessarily greater. These do not depend on the strength of his staff, any more than those of a general on the number of battalions in his army. It is said that he would have to manage 300,000 railway servants, a problem not, we presume, more insoluble (with an adequate staff) than the administration, now so admirably superintended, of some 50,000 employes in the working of the Post Office and Telegraphs.

Of the beneficial results of State management on public safety and convenience there can be little doubt. By whatever process this branch of the service of the State may be recruited, public opinion is powerful and vigilant enough now-a-days to scare off all attempts at nepotism; and there will be the manifest advantage that the administrators will have but *one* object to aim at, namely, the public interest. Railway officials, under the present system, are called upon to do that which the highest authority has pronounced impossible to man, namely, to serve two masters—the shareholders and the public: the main object of the former being that they should do the work *cheap;* of the latter, that they should do it *well.*

We all remember the outcry that was raised in the supposed interest of "political economy" when the telegraphs were taken in hand by the Government; and if the conveyance of mails were now in the hands of private companies, and the proposal were about to be made, for the first time, for the establishment of the admirable postal arrangements we have so long enjoyed, we should, no doubt, be solemnly warned that all our letters would be burnt or opened by the spies of a "paternal government." It is, however, at this time of day, rather difficult to comprehend why the carriage of our persons and our goods should be subject to more abuse in the hands of the State than the carriage of our letters and our messages.

Sir Edward Watkin attempts to frighten the Manchester Chamber of Commerce by the anticipation that "under this new system, if they wanted a new railway, they would have to fight for it on the hustings." Has this been the experience of Manchester or of any town or village in England in respect to postal or telegraphic communications? And if not, why are we to anticipate so flagrant a defiance of public opinion, and such reckless indifference to public convenience in our railway administration?

"But," say the alarmists, "look at your dockyards, see the waste and extravagance of your parliamentary ship-builders and naval administrators. Are you going to import all these evils into the management of our internal communications?" Now, if it were contemplated that the Government (instead of contracting, as it would probably do, for the supply of all new rolling stock) should set up a manufactory of locomotives, carriages and waggons, there might be a semblance of plausibility in this apprehension; but, even if there were no such distinction between the Government management of railways and of dockyards, it is well known that the two cases differ in all material respects. How often has the Navy been reconstructed, in order, as is alleged, to keep pace with the inventions of the day, and to enable us to hold the foremost place as a maratime power? The inevitable consequence of this condition of affairs has been an ever varying type of ships of war, with pecuniary results too well known to the country. In the case of our shipbuilding establishments, change has been inevitable, and with it has come expense. In the case of railway building establishments, whether in the hands of Government or of companies, it is perfectly well known that *perseverance in uniformity of pattern* in locomotives, the type of which rarely varies, is essential not only to economy but to success. There is, therefore, no real parallel between the two cases.

Those who object to the transfer of railways to the State on political grounds, appear to overlook one manifest advantage derivable from such an arrangement. We allude to the inportance, for the purpose of national defence, of placing our inland locomotion under Government control.

But, in order to anticipate what may be called "political" objections, applying rather to the future than to the present, we may notice the fears which have been expressed as to the possible action of the Government in respect of those portions of the country which are, as yet, unprovided with railway accommodation. It has been hinted that, in dealing with such districts, the Government of the day might, for political reasons, be tempted to embark in unporfitable undertakings. The area to which such a temptation might apply is not very considerable. And the danger, such as it is, might be easily met. Such extensions are of two sorts, those which relate to new lines or to works on a large scale, which should not be undertaken on behalf of any locality excepting on the understanding laid down as a principal *ab initio* that the Government are guaranteed that it will return interest at, say 5 per cent. upon the cost, any deficiency to become a charge upon the local rates. On this basis the course of Government would be simple enough as respects all such extensions, therefore it might safely comply with any local demands of this nature.

But besides this class of large extensions which will be comparatively rare, there are those gradual enlargements which a growing trade always demands, the necessity for which is felt by the managers and officers of railways in their conduct of its business without any demands from without. A large proportion of the cost of these enlargements would have, as is now the case, to be defrayed out of the revenue of railways. The Chancellor of the Exchequer would keep a check upon undue expenditure either on capital or revenue work; as respects the former he would have to include the estimated amount in his annual Budget, and as respects the latter, he would take care that the railway revenue upon which he had calculated was not diminished. It

seems to us that there would be inherent in the system a self-acting principle providing for the needful expenditure within prudent limits.

The most important part of this whole question is undoubtedly the financial one. Mr. Benson, who has entered at some length into this part of the subject, thinks that it is simpler than might at first sight appear. He bases his calculation upon the fact that the Government can raise money on much cheaper terms than companies or private persons, Government security bringing in an income of barely 3¼ per cent., and a railway security one of 5 per cent. It is the wide difference between the value of the two classes of security that would enable Government to deal liberally with the shareholders, and yet make a good bargain for the State. Moreover, the operation is one which would not present great difficulties. We have witnessed of late how readily and with what little disturbance of the money market such operations can be conducted, and in this case, moreover, it would not be a creation of new capital, but an exchange of one class of securities for another.

There are not wanting high financial authorities in support of the State purchase of railways, whose opinions are well known in the commercial world, but we cannot omit specially to notice the paper recently read before the Statistical Society by Mr. R. Biddulph Martin, whose views, though differing in some details from those which we have quoted above as to the precise mode of dealing with railway capital, point to the same practical result.

The question of the Government purchase of railways, so long as it is supposed to be in a transition state from the "happy land" of crotchets to that of sublunary realities, will, of course, have to run the gauntlet through a host of adverse critics. If the financial difficulties, so ingeniously magnified by Mr. Newmarch and others, should by any accident be overcome, many lines of defence will yet remain for the advocates of inaction.

The railway system as it stands, with its wide and fertile field for litigation—its grand career for rival managers, its ever-growing colossal monopolies—is to thousands of English idolaters an object of reverence as precious as ever was Diana to the craftsmen of Ephesus. The iconoclasts who rashly touch the shrine of these worshippers must be prepared for an uproar. And the *status quo* will be defended not only on grounds of self-interest, but of sentiment. We shall have a brigade of alarmists who will warn us that "Communism" is the goal to which all this sort of legislation must tend; that "we are turning the nation into a great co-operative society for the management of its locomotion." The simple answer to these suggestions in, that as the nation is already a co-operative society for the purpose of managing not only its mails and messages, but its army, navy, and police, the extension of the same principle to our locomotion and our traffic can not be, at all events, more than a development of the same revolutionary principles on which we are already acting so successfully. Nobody proposes that the State should work on railways or any other industrial monopoly for profit. The question is simply whether the profits, which in the hands of companies have to be squeezed out of all such enterprises, should, *pro publico bono*, be foregone together, and applied to the development and improvement of our internal communications.

But it is asked by those who cannot conceal from themselves the final results towards which we are gravitating, "Does not the Bill now before Parliament arm the Government with adequate powers to abate the evils with which we are threatened, and to coerce insubordinate railway companies into obedience?" "Try, at all events," they say, "what the Commissioners to be appointed under this Bill can do for you, before you attempt an operation so gigantic, and in the opinion of some critics so visionary, as the absorption of railways by the State." This dilatory plea would doubtless possess some force if the measure under consideration really armed the executive with such powers as could be exercised, both equitably and efficiently, in the public interests. But unfortunately the Bill, as it now stands, does not hold out the slightest prospect of such a result. Its leading principle (if it may be said to have one) is, that all railways throughout the kingdom should be open, without let or hindrance, to the transit of travel and traffic, irrespective of and beyond the lines of existing companies. In other words, railways are to be treated as if they were one interest. Now, if the State were prepared to buy the railways and pay for them, this principle would not only be a perfectly sound one, but its adoption would realise one of the most important objects aimed at by State purchase. But the new tribunal about to be created is, by the Bill as it now stands, empowered to make regulations binding on all railways still presumed to retain their rights as independent corporations. In other words, a court, from which there may be no appeal, is to be invested with the power of overriding and partially repealing all the Acts of parliament, on the faith of which shareholders have expended their capital. It is difficult to criticise a measure which has not yet assumed its final form, but it is not surprising that a scheme which, while it arbitrarily takes away the powers conferred by the Legislature, attempts to force reluctant partners into a compulsory combination, without providing for any equitable adjustment of their separate interests, should have encountered, in the first instance, a choral protest from the railway world.

But if the *equity* of Mr. Chichester Fortescue's Bill is doubtful, still more questionable is its *efficiency* for the only end such a measure can be intended to promote. The railway companies which, whether rightly or wrongly, consider themselves to be aggrieved by it will, of course, if it passes, set themselves to work to defeat any provisions which they may consider adverse to their interests. Nor will their task be a very difficult one. Compulsory through-rates and mail arrangements will afford fruitful topics of dispute, and if the railway companies can only start with a real grievance, they will be sure in the end to have the best of it in any quarrel with the Board of Trade and their Commissioners. Mr. Martin predicts that, if such a tribunal as that proposed by the Railway traffic Bill were really armed with the authority it would require, it would practically be a "Board of Control," similar to that famous Board which only existed as the precursor of imperial power. We fully endorse this prediction, and believing, as we do, that sooner or later this organic change must be made, we should greatly prefer to see it accomplished at once, or as speedily as may be, without a preliminary process of irritation which can only render all its stages the more difficult by the sense of unfairness which all meddlesome and onesided legislation invariably engenders.

We have endeavoured to set forth fairly the difficulties attending any effort to carry out the only railway form which we consider worth attempting; and we believe that those difficulties are less formidable than they may at first sight appear to be. The advantages to be gained from a successful solution of this problem are unquestionable. Sir Rowland Hill, in his Report appended to that of the Royal Commission of 1866, thus enumerates them :—

1. A pecuniary gain to the State.
2. A gain to railway proprietors in steadiness and security of income.
3. Security against Parliamentary contests, now so costly.
4. A reduction, eventually large, in fares, freights, &c.

5. Greater efficiency of management.
6. Increased postal facilities, and a cheap parcels' delivery.

To these may be added a considerable saving in the working expenses of railways, involving a reduction, according to Mr. Graves, of not less than 25 per cent. on their present amount. But, be it remembered, the question we have to consider is not simply whether the immediate advantages to be derived by the assumption of railways by the Government are worth the difficulties and controversies such a change may involve. It is not whether the accommodation the community now enjoys is sufficiently good, or the inconveniences suffered are sufficiently endurable to induce us to accept our present lot, rather than exchange it for another of the conditions of which we are ignorant. It would not be difficult to point to evils inherent in our present system for which State management promises an effectual remedy; but it is, as we have already stated, rather in anticipation of the dangers which threaten the best interests of the community, when railway amalgamation shall have run its full course, that we invite a calm and careful consideration of the only alternative available for their protection.

It is too late to inquire what might have been the result had we followed the example of our Continental neighbours, by mapping out the country, granting concessions for long periods, and retaining the reversion in the hands of the State. The contrast presented between that system and our own has been truly described by the late Mr. Joseph Locke* as one "between method and confusion in a matter of supreme national interest; *there* led and guided by the sovereign power, *here* ungoverned and undefended, abandoned to every kind of attack, and only conscious of authority in the shape of exactions."

The utter disregard of all law and system, under which our internal communications have been constructed, will render the railways of England a permanent monument of the ridiculous and disastrous achievements of "healthy competition" and "independent enterprise," embarked in hopeless and unequal race with gigantic industrial monopolies. But the experience of the past, no less than the manifest tendencies of the present, may afford us a timely warning for the future; and it is to be hoped that we have, at all events, learnt the futility of all attempts to manage our railway companies by arming a subordinate department of the Government with powers to scold and irritate, where it cannot command, and to issue orders where it cannot impose penalties on disobedience. We have tried the "laissez faire" policy, and it has failed; we have tried a meddlesome policy, and it has failed also. We have now, in the language of Captain Tyler, to meet the coming day when all the railways, having completed their several systems, may, and probably in their own interests will, "combine together to take advantage of the public." In the face of this contingency we have simply to make our choice between two alternatives—either "to let the State manage the railways, or to let the railways manage the State."

* Presidential Address at the Institution of Civil Engineers.

SHROPSHIRE SHEEP.

(From *The Farmer*, London & Edin., June 2, 1873.)

Although a comparatively recent breed, these valuable sheep are probably more widely distributed than any others, and merit increasing patronage, as they possess many sterling qualities. Although moderns in their improved character, says the *Field*, the original stocks were the Longmynds in Shropshire, and the denizens of Cannock Chase in Staffordshire. Plymley, who is quoted by Tanner in his prize essay on Shropshire, published in the 19th vol. of the "Journal of the Royal Agricultural Society," p. 42, thus describes the sheep:—"There is a breed of sheep on the Longmynd with horns and black faces that seem an indigenous sort; they are nimble, hardy, and weigh near 10 lb. per quarter when fatted. The fleeces upon the average may yield 2¼ lb., of which ¼ lb. will be the breechens or coarse wool, and is sold distinct from the rest. The farmers of the hill country seem to think the greatest advantage they derive from the access of foreign stock is from the cross of the Southdown with the Longmynd sheep; the produce they state to be as hardy and to bite as close as the Longmynd sheep, and the weight of the carcase is increased." Plymley's work was published in 1803; and, after such evidence, it is surprising that any one should contend for the purity of the Shropshires. Mr. H. Evershed, in his essay on Staffordshire, describes the dry surface of Cannock Chase, and its good climate, as favouring a heavier heath-sheep than occurs elsewhere. The original sheep had a short light fleece of about 3 lb., and a carcase which might be fattened at three years old to 8 or 9 stone. Their descendants, whilst retaining the same hardy character, are much larger, mature earlier, yield a heavy fleece, and a frame weighing 10 stone at thirteen months without extraordinary treatment. We have quoted these authorities in order to show that it is to the Southdown chiefly, though not entirely, that the present form and character of the Shropshire are due; indeed, about the only objection that can be urged against the breed is that, although for the last twenty years it has received much attention, there is still a lack of uniformity, although we trust this is now rapidly disappearing, as breeders are at last tolerably agreed as to the peculiar type that is most desirable. The variety could only be accounted for by the supposition that different crosses and different proportions had been tried, and we think there is no doubt this has been the case.

A great impetus was given to breeders when the Royal Agricultural Society recognized the importance of the breed by giving it a separate class, which was first done at the Canterbury Show in 1860. The wisdom of the step has been abundantly illustrated by the numbers and quality of the entries at all subsequent shows, at the present far outweighing any other breed. One reason for the difference of character which so long prevailed may be found in the fact that, whilst many breeders achieved from time to time prominent positions, there was no one who took such a decided lead as to impress his type permanently, as was the case with the Leicesters and Southdowns. Of the earlier breeders, we must single out for special notice Mr. Samuel Meire and Mr. George Adney as men who, pursuing a different practice, laid the foundation of the present breed. Mr. Meire carried on his operations at Berrington, until he gave up that farm and retired to a small estate of his own at Harley, the same parish in which Mr. Adney farmed. Mr. Meire was a good judge of stock, and set to work upon the coarse Shropshire, going chiefly for three points—straight spine with well sprung ribs, oblique shoulders, and good rumps. These points could not be obtained by cultivation or selection alone, and Mr. Meire introduced the Southdowns, buying or hiring rams from the late Mr. J. Ellmann, of Glynde. Aptitude to feed, with the short back and chine, were derived from a cross of Leicester blood introduced with great judgment. Having thus obtained what he desired, Mr. Meire endeavoured to fix the same by close breeding. That his sheep possessed much constitutional vigour is proved by the history of his celebrated ram, Magnum Bonum, who served for 11 seasons, his dam living to be 20 years old. He was the sire of Perfection, used by Mr. Foster, of Kinver Hill, which got the first-prize shearling at Chester. At the same show, Mr. Foster secured both prizes for ewes; the first-prize pen, bred by Mr. Meire, and described in catalogue "as

two 11 years 3 months and two weeks old, two 9 years 3 months and 2 weeks old, and one 7 years 3 months and 2 weeks old; pen of five Shropshire Down Ewes, dark brown face and legs." The fact that such aged ewes could be brought out in such condition as to beat blooming shearlings is a proof of constitutional vigour. In 1853, at Gloucester, Mr. Forster and Mr. Meire secured all the prizes, and every sheep was descended from Mr. Meire's stock. When Mr. Meire gave up the Berrington farm, he brought a few choice ewes to Harley; the number, we believe, never exceeded 40. The first year's sale of rams averaged 12 guineas for 14 sheep, the second 26 guineas. Mr. Henry Smith's flock, of Sutton Maddock, which was so well known at one time, was at first principally descended from Mr. Meire's stock, the great characteristic of all his sheep being quality. No man took more pride than Mr. Smith in his flock, so long as his health permitted. We visited the farm in the autumn of 1864, during very dry weather, and found every thing burnt up; notwithstanding the ewes were in excellent condition. They were on some dried-up seeds, without any water, yet looking uncommonly healthy. Small in appearance as compared with some flocks, because closer to the ground, they were thick, proofy sheep, with straight backs, oblique shoulders, and big rumps; quality, aptitude to feed, and true form, were unmistakable. The colour of face was dark grey, with flat foreheads; the legs black. Later on, both the Kinver Hill and Sutton Maddock flocks were altered in character by the influence of Oxfordshire blood. The size was increased thereby, but we very much question the policy of the cross. It may be here mentioned that Lord Chesham, whose flock now stands A 1, purchased a good many sheep from Mr. Smith, and thus a considerable percentage of Meire's blood must exist in his sheep.

Enough has been said to shew that Mr. Meire was a great improver in his day, and that his sheep made a considerable impression wherever they went; it is to us a matter of great regret that his operations were arrested at so early a period. Mr. Adney pursued quite a different plan to Mr. Meire; he stuck to the Shropshire as he found them, making his improvements by selections; his judgment was undoubtedly good. His most fortunate investment was the purchase of Buckskin, as a lamb, from Mr. Farmer, a celebrated breeder of his time. Buckskin was descended from a Southdown cross, and if the picture representing Mr. Adney and his sheep is a likeness, this was evident in his fine rather flat head, and grey character. Mr. George Horton, of Harnage Grange, Mr. Adney's nephew, possessed a good deal of his blood, and at one time when his Duke of Kent, a grandson of Buckskin, was in his prime, his reputation was considerable; but his flock lacked uniformity, and latterly his animals have wanted quality. The Messrs J. & E. Crane, of Shrawardine, Shrewsbury, followed closely in the steps of Mr. Adney, and for a series of years, dating from the Chester meeting in 1858 to that of Worcester in 1863, they were never out of the prize list, securing their chief honours with ewes, for the quality and character of which the flock was then justly celebrated. Latterly they have not taken prizes, though usually exhibitors.

Several of the animals have been highly commended, and we may say generally, that, though beaten, they have been by no means disgraced; indeed, the general character of their sheep reflects credit upon the management. The averages made by rams and ewes, at the August and September Shrewsbury Sales, have always been high, and sufficiently attest the reputation in which these sheep are held.

It would be impossible for us in the limits of a single article to attempt even an enumeration of the breeders who have assisted to make these sheep famous. Confining our attention to the county, we have at the present time two men who deservedly stand somewhat in advance of the ruck, viz., Mr. Evans, of Uffington, and Mr. Mansell, of Adcott. Both have been careful to establish in their flocks uniform character, and the type is now recognized as much what should be aimed at.

Our notice would be incomplete if we omited some of the more remarkable of the Staffordshire flocks. Last year one of the most celebrated was dispersed at extreme prices even for these sensational times—we refer to Mr. C. Keeling's, of the Ewetree Farm, Penkridge. We visited him in 1864, and found the land rather weak naturally, but kept up in high condition by the enterprise of the occupier. The flock at the time of the sale had been in existence nearly thirty years. Although this flock, like most of those bred in Staffordshire, originated from the Cannock Chase sheep, the quality it attained was due to judicious crosses from Masfen, Horley, and especially Patentee blood. Many of the ewes which we admired for their deep flesh and symmetry were by Gratitude, the highly-commended two-shear at Canterbury. His origin is curious. When Mr. Byrd hired old Patentee, Mr. Keeling was allowed to send one ewe to him. He chose a fine specimen by old Norton, from Masfen's sale. Gratitude was a twin. Mr. Keeling's sheep were uniform in character, the features rather dark, not well-woolled on the forehead; big, thick sheep, shewing much constitution. We believe the reason for the sale was that Mr. Keeling has left his farm. Mr. John Coxon, of Freedford Farm, Lichfield, ranks high as a Staffordshire breeder. His flock originated in 1825, descending from the Whittington Heath sheep—a breed of hardy sheep very similiar in type to those of Cannock Chase. The flock comprised, at the date of our visit, 129 ewes. Thirty rams are reared, of which twenty are brought to the hammer. They are grand-looking sheep, and much appreciated by breeders. The average of 1864 was £17 3s. 4d.; forty yearling ewes made 67s. each. Since that time higher prices have been realized. Nobleman, the third-prize old sheep at Worcester, and which has been already alluded to, was the sire of the yearlings, and very promising they looked; indeed, the stock throughout were highly creditable. Mr. Coxon is a good feeder, and occasionally illustrates the feeding qualities of the Shropshire; in 1862, one of his old wethers weighed 59 lb. a quarter. Mr. Coxon superintends Col. Dyott's flock, which has also achieved considerable success. Of late years Mrs. Beach, of the Hattons, near Wolverhampton, has made her mark, carrying off at the Wolverhampton Show a special prize as the winner of the greatest number of prizes. The land is particularly favourable for early development, and few can bring out lambs or even shearlings in such perfection. Her sheep are not large, but possess great symmetry and particularly matchy heads.

The Shropshire sheep of the present day exhibit much of the quality of the Down, with considerably more size; the features are rather longer, of a uniform dark but not black tint, the eye full and large, the forehead moderately flat and well-woolled, the ears rather large and thin, standing well out from the head. Much improvement in symmetry has taken place of late years. Formerly the shoulder was frequently upright, the spine not straight, the top far from level, and the fore quarter generally light; now the best-bred sheep are as true-grown as the Downs. The character of the wool is of great importance, especially where the climate is moist. An open condition of wool is to be deprecated; the staple should be fine and close, with which a good weight is quite possible. Although capable of making considerable weight upon good keep, we do not consider the Shropshire can mature so rapidly as such breeds as Leicester or Cotswold; the closer

texture of meat requires a longer time to deposit. With ordinary management the shearlings are brought to market during the summer off grass, when their quality and moderately small weight render them very suitable to the season.

THE GROWTH OF ROOTS.

(From the *Mark Lane Express*, June 2, 1873.)

At the last meeting of the Ixworth Farmers' Club, the subject for discussion was the growth of Roots, introduced by Mr. P. M'Lagan, M. P. for Linlithgow; the President of the Club, Mr. E. Greene, M. P. in the chair.

Mr. M'Lagan said this was a comprehensive subject, embracing the turnip, the mangold-wurtzel, the carrot, kohl-rabi, and other roots. He intended to confine his remarks chiefly to the cultivation of the turnip, as he knew more about that than he did of other roots. If you cultivated the turnip well you would be able also to cultivate any of the other roots. Root cultivation might be said to be one of the great pillars of the modern system of farming, and thorough draining the other. Even the Roman writers upon agriculture many centuries ago impressed upon their countrymen the necessity of growing roots; and Lord Kames, a Scotch writer, about a century and a-half since, said the man who first introduced the turnip into Scotland deserved more honour than many a man who had won great battles. Another writer said before the introduction of the turnip-crop it was extremely difficult to find support for the cattle and sheep in the winter and spring months; and during them it was never so much as thought of feeding or preparing animals for market unless there was a full stock of hay. In England the turnip cultivation was understood and practiced long before it was in Scotland. In fact, he believed the Scotch people borrowed the system from the county of Norfolk. So important was it considered to have turnips cultivated, that when first introduced premiums of £3 per acre were offered to the farmers to grow the roots. He would divide the subject into three heads. Firstly, as a cleaning crop; secondly, as an alimentary crop; and, thirdly, as a manurial crop. With respect to the cleaning, the land should be thoroughly drained and dry, thoroughly pulverised, cleaned and manured, before sowing. If the land was not naturally dry, it should be made so by thorough drainage. Many lands considered dry he found were much benefited by draining. In many parts of Scotland the dry and light lands had an under water, and if that was not taken away the land was so cold that the roots did not get the full benefit of the manure, and the crop often lingered and died quite away. The importance of drainage was generally admitted in the present day, but the working of the land for the root crop was too much overlooked. The working of the land showed the skill of the farmer, and the manuring of the land showed his wealth. If the farmer worked his land well, combined with plenty of manuring, there was an amount of power in that farmer which would overcome difficulties with which he would otherwise be unable to cope. So important was the working of the land considered in early times, that Cato, writing three thousand years ago, said the three essentials to good farming were—first, the working of the land well; secondly, to work it; and, thirdly, manuring. From the fact of his mentioning it twice, he evidently attached greater importance to the working of the land than to the manuring of it. About two centuries ago, Jethro Tull professed to grow roots simply by the thorough pulverising of the land and exposing it to the air. Another writer said the thorough working of the land was the foundation of a root-crop generally. The first preparation for a turnip-crop was the getting the land in proper order in the autumn. In some climates the principal part of the working depends upon what in done in autumn. Owing to the climate, more particularly in Scotland, farmers were not able to practice the autumn cleaning as much as they could wish; but whenever it could be done no farmer should lose the opportunity of doing it. It saved a great deal of labour in the spring, and if there were weeds in the land they were prevented from taking much root, and causing a great deal of labour in the spring months. He recommended deep ploughing in the autumn, but he cautioned his hearers to take crre not to go deeper in the spring. He described the method of working the land. In the spring, when the weather was dry, they harrowed the land and gathered off the weeds, so as to prepare it for the turnip-crop. Having got the land into proper order, it was then drilled. The land was thrown up into small ridges of 27 inches in width, similar to the plan adopted in England for mangold-wurtzel. One important question was as to the width of these ridges. There were three points to be considered—the first was to have them as narrow as it was possible for the horses to work in them; secondly, if you were going to manure heavily, you should have them as wide as the manure covered by them; and, thirdly, you should take care not to have them so wide, but that the stalks of the turnips might cover the surface and prevent the growth of weeds. His experience was that the ridges should never be narrower than 25 inches, or wider than 30; but the ordinary width was about 27 inches. The next point was the manuring. He would first state what he considered the best way of manuring with ordinary farm-yard dung. There were two ways in which it might be applied, in the autumn on the stubble, or in the ridges. If applied in the autumn, care should be taken to have the land dry, and in putting the manure on the land to spread it and let it lay so; it would do no harm, because the temperature of the atmosphere was not such as to cause evaporation, whilst the rain washed all the valuable ingredients into the soil. Some might object to this application of manures on light lands. None would object to applying it in the autumn on heavy lands, because it was well known that clay soils absorbed and retained all the valuable salts of manure. In light lands, however, the power of retaining the salts was not so great, and some people might object to applying manure in the autumn. He had made some experiments. He selected a gravelly soil. He applied 16 tons of manure to the acre, and left the rest of the field unmanured till the spring, and another part without any manure at all. In the spring the whole field was treated in the same manner, and was ridged up in the same way. He then applied another 16 tons of the same manure to another part of the field in ridges. In the month of December he raised his crop, and weighed it. In the part manured in the autumn, he had 15 tons 16 cwt. per acre; on that manured in the spring, 15 tons 10 cwt.; and that which had no manure, 8 tons 11 cwt. The tops in the first weighed 3 tons 19 cwt.; in the second, 4 tons; and where there was no manure, 4 tons 15 cwt. There was, therefore, but little difference between manuring in the autumn and in the spring; but there was a great difference where there was no manure at all, as compared with where it was manured. The quantity of manure that should be given depends very much upon the quality. He felt that farmers were apt to place too high a value upon manure made from oil-cake. There was as much manurial value in a ton of good Peruvian guano, containing 15 per cent. ammonia, at £15 per ton, as there would be in oil-cake costing £14 per ton. Cotton cake was the same. A great part of the cake was consumed by the animal, and therefore the whole of it did not go into the manure. A farmer should act entirely as a merchant. If he could buy

manurial stuff that would produce the same effect as the manure of oil-cake, he did not see why the farmer should buy the oil-cake, for which he only got one-half the value. He had made some experiments, and he found that it did not come to more than one-sixth of the value of the cake purchased. There were circumstances to be taken into account in purchasing oil-cake, such as a light-land farmer at a distance from a place where he could purchase manures; and he might find it to his advantage to give the sheep the oil-cake, so as to improve the mechanical quality of the soil; but, taken for its manurial qualities, he (Mr. M'Lagan) would not advise a farmer to put such a high value on oil-cake manure as was generally done in this country. A bill was before the House of Commons at the present time, which proposed to give compensation for improvements done by the tenant, and one of the things mentioned was the unexhausted manurial effects of oil-cake. We should take care, therefore, in considering a question of this kind, that the incoming tenant was not compelled by the Legislature to give more for an article buried in the soil than it was really worth. Even the outgoing tenant frequently did not know the quality of the cake consumed. Another circumstance to be taken into consideration was as to how the oil-cake had been consumed. If consumed by young animals it was evident that the manure could not be of the same value as if consumed by an old animal, because a great part of the phosphatic manure would go to make bone. If the ox was in good condition the manure made from the cake was of far more value than the manure consumed by a lean animal. If you gave only a moderate amount of oil-cake, 3 lbs. to each animal, the manure from that would not be so great as if the animal had 6 lbs. or 8 lbs. Beside the farmyard manure there were most important manures which were used for the turnip-crop. There were the phosphates, the super-phosphates, and the ammoniacal manures. We should bear in mind that when the soil had become thoroughly saturated with phosphatic manure, to bring out the qualities of the manure it was essential to apply a considerable quantity of nitrogenous manure As to whether the phosphates should be applied in a dissolved or undissolved form was another question for consideration. He had known instances where phosphates undissolved had produced as large crops as if dissolved. Speaking for his own climate, when all the phosphates were dissolved in the manure applied, the root was apt to come to maturity rapidly, and if there happened to be a good growing November or December the root received no advantage in these months. This was owing to there being too little ammonia in the manure, and too much soluble phosphate. If there had been a little more ammonia the root would have kept growing, and there would have been a much better crop. Next came the sowing. He divided the turnips into three varieties, the white, the yellow, and the swede. There were a great many varieties of the white turnip. They did well to afford an early bite for the sheep in the autumn if the grasses failed. The yellow stood the frost a great deal better, and was of far better quality than the white. The swede was of still greater feeding quality. In the white and the yellow variety the feeding quality diminished as the size of the root increased. Such. however, was not the case with the swedes—the feeding quality increased with increased size, and therefore it should be the aim of the farmer to grow as large swedes as possible. Large white turnips are apt to rot, and they contained as much as 90 to 92 per cent. of water. As to the singling, the most important point was as to the space left between the different plants. Where you had manured heavily, and where the ridges were about 27 inches wide, the turnips should never be left closer than 12 inches; it would be better to allow 15 or perhaps 18 inches. An experiment was tried in East Lothian. The roots were singled 10 inches, 20 inches, and 30 inches; and the farmer got, with the 10 inch, 20 tons 15 cwt.; with the 20 inch, 23 tons 6 cwt.; and with the 30 inch, 22 tons. It would, therefore, appear from this that 20 inches was the proper width for singling turnips. Having grown the turnips, the next subject for consideration was as to what was to be done with them. It Scotland, where the land was light, they consumed about half, and drew the rest. In topping and tailing care should be taken not to cut too closely to the bulb. If cut too near, the turnip bled, and a good deal of the sap was lost. Having taken them up on light land, the best plan was to cart them off immediately; they should not be allowed to remain one night in the field after being pulled. On clay lands the turnips should be pulled and thrown into heaps, and covered with the tops, and allowed to remain till a frosty morning, when the ground was hard and then they could be carted off. To cart on clay soils, when the land was soft, was most deleterious to the next crop. It was owing to this that many persons had lost so much money by growing turnips on clay soils. Having remarked that if a root was bitten by ground game and a frost followed, that bulb was destroyed, Mr. M'Lagan described the process of covering up the roots by means of the plough. Coming to the question of cost, he said before the rise in wages he considered his turnip crop, working the land, the horse, the manual labour, etc., cost him from £2 to £2 10s. per acre. Now he was paying something like 20s. to men whom he formerly paid only 10s. to 12s. He put the labour at £4; manure, 16 tons per acre, at 5s., another £4; and then 3 cwt. of phosphates. at 6s., 18s.; the total was £8 18s. All this should not be put against the turnip crop. A great deal of it remained in the soil, and instead of charging the whole £4 for that, you should charge only one-third of it. He now came to the second head, the alimentary or feeding crop. How many cattle would an acre of turnips keep during the winter and spring months? If you had a crop of turnips, 20 tons per acre, and each beast consumed 150 lbs. per day, that would keep two for five months; if you allowed them one cwt. per day, it would keep three; and 84 lbs., about four cattle. He believed that a great deal of money was often lost by giving an excess of turnips to oxen. In some parts of Scotland, when cattle were first put up, they were allowed roots *ad lib.* They were not stinted at all, and the result was that he had known them to eat as much 3 cwt. of white turnips per day. Where no cake was given the quantity consumed would be about 150 pounds. Finding the turnip crop very exhaustive, and having a good deal of clay land, he resorted to the pulping system. He never allowed more than one cwt. per day, and for young cattle 80 lbs. He gave in addition other feeding stuffs. Instead of oil-cake, which was expensive, he gave them rape-cake, which was identical in composition. As to the value of a ton of turnips, for feeding purposes, if he got 6s. or 7s. a ton he considered himself paid, because there was considerable value got from the manure in feeding turnips. Alluding next to the manurial value of the turnip, he said, supposing two animals were fed upon an acre of turnips, they would consume ten tons in five months; they would consume at the same time one ton of straw for manure, besides what they ate. One ton of straw would produce something like six or seven tons of manure. So an acre would produce about 13 tons of manure. Supposing a man had a farm of 100 acres, and it was managed upon the five-shift course, two parts in wheat crop, one part in roots, and two parts in grass, the part that would require manuring is in roots. For the two parts in wheat and the one part in roots, from the calculation he had made, there would be something like 260 tons of manure; that was 13 tons from

each of 20 acres. Supposing he had to manure 20 acres for the next crop of turnips, and he gave 18 tons per acre, that would require 360 tons, and there were only 260 tons. This was easily explained. Every practical man had, no doubt, found that he could not make a sufficient quantity of manure to manure the farm thoroughly, and consequently they had to go to the manure merchant. If they went to a proper merchant, and bought an unadulterated manure, they could not invest their money in anything which would pay them better. Of course there was a good deal of other straw consumed by the horses and other animals. Mr. M'Lagan commented on the diseases in turnips, and mentioned the finger-and-toe disease. Perhaps the cause of it had not been discovered, nor had the real remedy. The application of lime had proved the best remedy he had tried. In coming by train to-day he saw little or no preparation of the land for roots. He supposd that the farmers of this country were becoming alive to the fact that labour was becoming so expensive that they tried to encourage as much as possible less labour on the farms. In conclusion, he referred to the point whether it was not possible to encourage labour by having less land in cultivation and more in grass. Unless they could employ steam power farmers would be obliged to do this. It might be said that all lands would not grow grasses for any length of time. This was a mistake. By the application of the same quantity of manure on the grass as when the land was in cultivation he did not doubt but that there would be a good crop of grass. There were two points to be considered in the cultivation of grass land. One was to keep the grass improved by manure, and the other was not to bite it too bare in the summer, by which the next year's crop was lost, and the better grasses were killed by the drought.

Mr. S. Peto said that the views expressed by Mr. M'Lagan were exactly those of gentlemen who farmed in the counties of Suffolk and Norfolk. It was important that the land should be well drained, and got into a proper state before planting the turnip crop. Mr. Peto gave an instance in point, and expressed his opinion that much damage was often done by ploughing land when it was not in a proper state. As to the manure, it was very important that they should use phosphates on such land as theirs in that locality. After manuring the layers heavily, as was often done, it was thought that good crops would follow, but this was not always the case. In fact, it was impossible to grow turnips without the assistance of phosphates; but with the assistance of a small quantity of phosphates they could grow a good crop. Swedes required more room than other turnips, and he considered 27 inches a proper distance. He approved of autumn cultivation, but he regretted that owing to the shortness of labour he and some of his neighbours were not in that forward state of preparation they ought to be at this season of the year. Having spoken of the system of housing followed in this country, he alluded to the disease in the turnips, and said the disease invariably affected the early sown turnips; they came up and looked well for a time, but afterwards disappeared altogether. There was much less of the disease amongst the late sown turnips.

SUPPOSED HOLLOW HORN OR HORN AIL IN TEXAS.

The following letter from an esteemed correspondent in Texas, and the accompanying comments of Prof. Law, will be found of interest:

———, TEXAS, *Feb.* 24, 1878.

Dear Sir—In the Report of the U S. Commissioner of Agriculture for 1871, I find in its digest of State Reports a notice of an article in the 29th Vol. of the Transactions of your Society, written by Prof. Law of Cornell University. "He," Prof. Law, "refers to a disease misnamed 'Hollow Horn,' or 'Horn Ail,' and protests against boring the horns or sawing them off, and applying pepper and salt and other irritants, for this disease, as a fiendish practice, and says the true symptoms, which are those of fever, should be sought out and the proper remedy applied." The Professor then gives, according to the extract from his article in the U. S. Report, a detailed statement of an elaborate treatment which he considers appropriate for the disease in question. See U. S. Agricultural Report for 1871, page 386.

My observation of the "Hollow Horn," running through upwards of thirty years, in Texas, leads me to suspect strongly that Prof. Law is not familiar with the disease which we know under this name in Texas. In the little I have to say I shall speak of the "Hollow Horn" as it presents itself here.

The disease is common in Texas. It prevails, I believe, exclusively in the winter months, and is the principal cause, in my opinion, of the mortality of Texas cattle during this period of the year. It is not a fever, as the Professor alleges it to be, but to my best appreciation of its symptoms it is a simple depression of the vital powers. This depression, or considerable exhaustion of the vital forces, is caused by the rapid abstraction of animal heat by our strong, cold winds of the winter months, succeeding suddenly after warm and genial periods—fierce northers sweeping down "butt end foremost," in common phrase, from the Rocky Mountains, bursting upon herds, unprotected in the prairies, while enjoying spring weather. Animals sheltered in wooded bottoms are scarcely if at all subject to this disease.

For a long time I suspected that "Hollow Horn" was only another name for hollow belly. But my error was shown me years ago by seeing fat animals attacked by it, though well fed, yet suffered to stand in an open pen, exposed to the direct sweep of the northers. It seems, however, hardly necessary to add that lean animals appear more subject to "Hollow Horn" than fat ones.

My account of *some* symptoms must be drawn from work oxen and milch cows chiefly, for obvious reasons. The coat of the animal is not sleek, as in health, but rather rough, as from being out of condition. The animal is languid and weak, moves around dully and continues to graze; the appetite is not much impaired, if any; the thirst does not appear to be unusually increased; the animal dungs and stales regularly; the eye is languid, not watery nor bloodshotten; the horns, which in health have an agreeable warmth on handling near the head, are now found to be cold to their base; if bored into, they are hollow, that is, the pith is shrunken from the outer horn, and bloodless. There is great muscular weakness, and, I think, muscular rigidity. If the animal is made to run violently, it falls; or if it falls from any other cause it is unable again to get upon its feet; it struggles and flounders about for from two to seven or eight days, eating fodder or hay, if placed before it, to the last moment, and if left to itself, invariably dies. If the animal having the "Hollow Horn" keeps on its legs and lingers along, as probably a majority of them do, warm weather and, probably, more nutritive food restore it to former health.

You see I have not attempted an exhaustive description of symptoms, and that I do not consider the hollow horn the whole disease.

If the animal having the disease is gentle, as a work ox or milch cow, so that it can be handled, shelter, ordinary food and boring the horns with a gimlet about two inches from the head, insure prompt recovery. In mild commencing cases, among my own oxen (and I

have had charge of no other), I have trusted to thorough rubbing with spirits of turpentine about the roots of the horns and the spine of bone between the horns, and successfully. I would not risk a severe case without boring. Oxen of mine have died of hollow horn where it seemed to me that boring would have saved them. The Professor protests against "boring" as a "fiendish practice." Boring is not painful; at least the animal gives no admonition of suffering.

Under the simple treatment of shelter, ordinary food and boring the horns, I do not remember now a fatal case or protracted recovery. The curative armament recommended by the Professor would appear to our people pretty formidable, expensive and cumbrous. By the way, I never knew the smallest subsequent inconvenience from the boring. Persons familiar with the ways of stock cattle (our term for those roaming without any restraint over the prairies) need not be told the difficulty of doing anything for them if attacked with hollow horn.

As I have not been able to see any volume of your Transactions since the 26th, for 1866, all my knowledge of the Professor's article is derived from the notice in the U. S. Report above referred to. But with these lights I am strongly led to suspect that the disease treated of by Prof. Law is not the disease known on the southwestern prairies as the "Hollow Horn."

On looking over what I have written, I find I might have added that "boring" is almost solely relied on in Texas for "Hollow Horn," with the insertion of a little salt and pepper, or some other pungent matter. I have so little faith in their efficacy—perhaps incorrectly—that I dispense with them, depending on simple boring.

REMARKS OF PROF. LAW.

The malady referred to appears to be manifested mainly or exclusively by a general prostration of nervous power, but the true nature of the affection might be more definitely ascertained by a few careful *post-mortem* examinations. The coldness of surface is no proof of the absence of fever, nor is the presence of appetite and thirst, nor even the regular action of the bowels and kidneys. If the bulb of a clinical thermometer were introduced a few inches into the anus, and ratained there for three minutes, the temperature recorded would show whether or not fever existed.

It will probably be hard to convince your correspondent that the horns are cold and bloodless because of the chill and the retreat of blood from the surface. He may, however, become assured of the soundness of the horns, if he will consider that the contraction of the walls of the blood vessels in torn wounds is such that bleeding is either reduced to a minimum or entirely prevented, and that the twisting of a cut vessel is one of the most efficient modes of checking hemorrhage. This condition we have in the tissues rudely torn with the gimlet, while bleeding is still further prevented by the existing coldness of the part and the contraction of its vessels.

Were the horns shed from the heads of the animals which drag on a lingering existence after the attack (as has happened from eating ergot), I could believe that they were really dead and bloodless; but so long as the surviving sick retain their horns, it must be held that the nutrient vascular surface *has not shrunken from* its horny covering. If your correspondent will find me a specimen from an animal just dead, in which the *quick* has shrunken from its horny envelope, I will cheerfully acknowledge it a case of *hollow horn*, but must still insist on the dropping off of the horns in the surviving sick as a necessary sequel of such a condition. He must bear in mind that the bony supports of all healthy horns of cows and steers over two and a half years old, are hollow, but that the hollow is in the centre, there being no space between the horn and the *quick*. The varying resistance met with in boring depends on the thickness of the horn, and whether or not the gimlet strikes one of the many bony pillars which extend across the cavity within the horn. This will be manifest to every one who makes a longitudinal section of the horn and its contents, with the saw.

The symptoms given, strongly resemble those produced by particular winds in other parts of the world—such as the *sirocco* of Southern Europe; the *Kampsin* of Egypt; the *Samoum* of Western Asia; the *Pak-Fung* of China, and the *Viento-de los muertos* of Mexico. This last was represented hieroglypically by a *death's-head*, by the ancient Mexicans. Though it blows from the south, it is quite likely that it is in part deflected by the Rocky Mountains, and confers its own enervating qualities on the "fierce Northers" which sweep over Texas in winter and spring.

Whatever the enervating agent in such winds—whether electrical disturbance, malaria, dust, warmth, cold, moisture or dryness, all of which have been charged with the evil—there can be no doubt of the bad results; and from your correspondent's account it would appear that in Texas, as elsewhere, a shelter is a sufficient protection; for "animals shelterd in wooded bottoms are scarcely if at all subject to this disease." I think it highly probable that the recoveries he speaks of are mainly due to the "shelter and ordinary food," rather than to "boring," "pepper," etc. At the same time it is quite likely that the irritation caused in the skin by friction with turpentine, may act as a stimulus to the nervous system and assist in rousing the animal from its apathy. The same remark will apply in part to *boring*, which, although not resented at first by the benumbed and torpid animal, yet with returning vigour will become as painful as a similarly lacerated wound through the human nail and the sensitive parts beneath.

My advice would be, to adopt the easier and more humane course of driving the stock into "wooded bottoms" or other sufficient shelter, on the advent of the *Northers*, and feed them there, if necessary, until the danger were past.

In the case of prostrated animals, which quiet and shelter have failed to restore, benefit may be derived from frictions with turpentine or mustard on the sides of the neck or the limbs; from the administration of stimulants, such as an ounce of oil of turpentine shaken up in milk or oil, and attention when necessary to secure a moderate action of the bowels, kidneys and skin. In some instances nervous and spinal stimulants may be needed, but it would be unsafe to employ them on cattle which could not be kept under close observation.

NOTICES AND DONATIONS.

Transactions of the Vermont Dairymen's Association for the year ending October 28, 1872.

Proceedings of the Philosophical Society of Glasgow, 1871-2, vol. viii, No. 1.

Twentieth Annual Report to the City Council of the Manchester Public Free Libraries, 1871-2.

Annals of the Society of Natural Philosophy of Nassau, vols. 25-26, 1871-2.

Agricultural Annual of the Prussian Agricultural Schools, vol. 1, part 1, 1872.

Papers of the Vienna Society for the Promotion of Natural Science, vol. xii, 1871-2.

Bulletin of the Imperial Society of Naturalists of Moscow, 1872, parts 1 and 2.

Reports of the Sessions of the Sections of Mathematics and Physics of the Royal Bavarian Academy of Sciences, 1871, part 3 ; 1872, parts 1 and 2.

Index to the Reports of the Sessions of the same sections of the Royal Bavarian Academy of Sciences, 1860–70.

Journal of the Transactions of the French National Academy, for Agriculture, Manufacturers and Commerce, and of the General Statistical Society; September, October and December, 1872, and January and April, 1873.

Meteorological Report of the Royal Meteorological Institute of the Netherlands, 1871, part 1.

Annual Reports of the Agricultural Society of Bremen, 1870 and 1871.

Journal of the Central Agricultural Society of Belgium, November 1871 and October 1872.

Agricultural and Arboricultural Gazette for Northeastern Germany (Prussian Provinces), Königsberg, No. 14, April 6, to No. 41, October 12, 1872.

Annals of Agriculture in the Royal Prussian States, 1872, No. 1, January 8, to No. 52, June 29.

Agricultural Journal of the Grand Duchy of Oldenburg. Fortnightly, March 3, 1870 to December 26, 1872.

The Canadian Entomologist, Monthly Journal of the Canadian Entomological Society, vols. 1–4, 1868–1872.

Thornton's Short Horn Circular, No. 19, January 1873.

The Relations of Botany to Agriculture, a Lecture before the Massachusetts State Board of Agriculture, December 9, 1872, by William S. Clark, Ph. D., President of the Massachusetts Agricultural College and Professor of Botany and Horticulture.

Proceedings of the Boston Society of Natural History, vol. xv, part 1, January to April, 1872.

Transactions of the Massachusetts Horticultural Society, for 1872.

Tenth Annual Report of the Massachusetts Agricultural College, January 1873. (Copies were received from President Clark and from Professor Goessman.)

Bulletin of the National Association of Wool Manufacturers, vol. iv, No. 1, January–March, 1873.

Transactions of the N. Y. State Agricultural Society for 1857–59–'60 and '61, from A. D. Griswold, Southport, N. Y.

Monthly Reports of the Department of Agriculture, Washington, D.C., for March and April, ten copies of each.

Journal of the Royal Society of England, second series, vol. ix, part 1, 1873.

First Report of the Vermont Board of Agriculture, Manufactures and Mining, 1872. (7 copies).

Proceedings of the Georgia State Agricultural Society, in Convention at Augusta, Ga., Feb. 11–13, 1873.

Bulletin of the Sessions of the Imperial Central Agricultural Society of France, third series, vols. 3–7, 1867–8 to 1871–2.

Papers upon Agriculture and upon Rural and Domestic Economy; published by the Imperial Central Agricultural Society of France; 1866, parts 1 and 2; 1867, 1868–9, 1870–71 and 1872.

Weekly Journal of Gardening and Botany of the Society for the Promotion of Horticulture in the Royal Prussian States; No. 13, March 30 to No. 52, Dec. 26, 1872.

Oversigt over det Kongelige Danske Videnskabernes Selskabs i Kjobenhavn; 1871, No. 3; 1872, No. 1.

Third, Fourth and Fifth Annual Reports of the State Entomologist of Missouri, 1870–1–2; from Charles V. Riley, State Entomologist of Missouri.

Constitution and By-laws of the Minnesota Academy of Natural Sciences; with an Address by the President, and list of officers and committees for 1873.

Transactions of the Highland and Agricultural Society of Scotland; fourth series, vol. v, 1873.

Second Annual Report on the Diseases of the Domestic Animals of Connecticut, by N. Cressy, M. D., Veterinary Pathologist to the State Board of Agriculture. (From the Sixth Annual Report of the Secretary, 1873.)

Twentieth Annual Report of the Secretary of the Massachusetts Board of Agriculture, for 1872; twenty-two copies.

First Annual Report of the Western New York Butter Makers' Association and Farmers' Club, 1872–3.

Annual Report of the New Jersey State Agricultural Society for the year 1872.

Report on a Topographical Survey of the Adirondack Wilderness of New York, by Verplanck Colvin; 1873, pamphlet, 43 pp. with map.

Report of the Secretary of the Iowa State Agricultural Society, for the year 1872; ten copies.

MUSEUM.

From P. J. Carroll, Albany. Mass of bristles found in the stomach of a healthy fat hog slaughtered in the autumn of 1872, by Mr. Richard Bowdish, Charleston, Montgomery county, N. Y. Weight a little over 7 oz. The mass is somewhat kidney-shaped, six inches in length, somewhat constricted in the middle, with a diameter of three inches; the bristles are not so glued together as to present a smooth surface like that of the hair-balls found in cattle, but are distinct and unchanged—apparently attached at their ends towards the middle constricted portion of the mass and lying curved towards the ends, as the human hair brushed each way from a parting. Colour of the bristles, reddish-yellow.

CIRCUMSTANCES.—It is stated by Mr. Carroll that the hogs, sent to the Charleston cheese factory to consume the whey, were kept in pens placed in one long row, to which the whey was conveyed by a single trough running to and along the whole length of the row of pens. The hogs at the further end began to die suddenly, and on being opened large masses of bristles were found in their stomachs. The rest of the hogs were then taken away from the factory and generally did well; but, when slaughtered, masses of bristles were found in all of them, small ones in those that occupied the pens nearest the factory, and becoming larger and larger in the hogs that had been in the pens further and farther down the row. The natural explanation is, that the animals in crowding up to and into the trough at feeding time, rubbed off bristles which fell into the whey and were carried on with it in constantly increasing quantity, the hogs at the lower end getting so many that death ensued, probably from the bristles actually occupying the whole stomach.

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THE JOURNAL

OF

The New-York State Agricultural Society.

VOL. XXIII.] ALBANY, JULY AND AUGUST, 1873. [NOS. 7 & 8.

OFFICERS FOR 1873.

President—BENJAMIN F. ANGEL, of Livingston.

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2d district—EDWIN THORNE, of Dutchess.
3d district—DANIEL DONCASTER, of Albany.
4th district—FRANK D. CURTIS, of Saratoga.
5th district—JAMES GEDDES, of Onondaga.
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8th district—WILLIAM H. PENDRY, of Orleans.

Corresponding Secretary—THOMAS L. HARISON, of St. Lawrence.

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Mechanical and Consulting Engineer—HENRY WATERMAN, Hudson.

Consulting Veterinarian—Prof. JAMES LAW, M. R. V. C., Ithaca.

Chemist.—WILLIAM M. HABIRSHAW, New York.

State Agricultural Rooms.

The Office of the Society is in the Agricultural Hall, corner of State and Lodge streets, Albany; and all communications on business of the Society should be so addressed.

ANNUAL MEETING.

Pursuant to amendment of the Constitution adopted at the Annual Meeting of 1872, the Annual Meeting will hereafter be held on the Wednesday succeeding the third Tuesday of January in each year, at the city of Albany.

Annual Meeting of 1874, January 21st.

New-York State Agricultural Society.

FAIR OF 1873, AT ALBANY.

PROGRAMME.

Officers in Charge of Departments.

Class I. CATTLE, JOHN D. WING, Vice-President.
II. HORSES, JAS. W. WADSWORTH, do.
III. SHEEP AND SWINE, JOS. JULIAND, of Executive Com.
III. POULTRY, FRANK D. CURTIS, Vice-President.
IV. IMPLEMENTS AND MACHINERY, JAMES GEDDES, Vice-President.
Class V. GRAIN, &c., WM. M. HOLMES, of Executive Com.
V. DAIRY AND DAIRY IMPLEMENTS, HARRIS LEWIS, of Executive Com.
VI. FRUITS AND FLOWFRS, ISAAC H. COCKS, of Executive Com.
VII. MANUFACTURES AND MISCELLANEOUS, DANIEL DONCASTER, Vice-President.
PRESS DEPARTMENT, W. H. BOGART, Rec. Secretary.

Superintendents.

GEN'L SUPERINTENDENT, H. BOWEN, Medina.
Supt. of CATTLE, THOMAS V. MAXON, Adams.
HORSES, JNO. F. QUICK, Suspension Bridge.
SHEEP AND SWINE, J. A. C. KELLOGG, Adams.
POULTRY, CH'Y BOUGHTON, Waterford.
IMPLEMENTS, &c., J. W. SMITH, Geddes.
GRAIN, &c., G. M. INGALSBE, Fort Edward.
DAIRY, &c., H. W. DEXTER, Newport.
FRUIT AND FLOWERS, JAS. VICK, Rochester.
MANUFACTURES AND MISCELLANEOUS, JOHN S. DICKERMAN, Albany.
FORAGE, M. C. REMINGTON, Weedsport.

Time for Judging the Several Classes.

CLASS I—CATTLE.	
SHORT-HORNS	Wednesday, Sep. 24, 2 P. M.
DEVONS & HEREFORDS	Thursday, Sep. 25, 10 A. M.
AYRSHIRES AND HOLSTEINS.	Friday, Sep. 26, 10 A. M.
JERSEYS	Saturday, Sep. 27, 10 A. M.
GRADES, &c.	Monday, Sep. 29, 10 A. M.
CLASS II—HORSES.	
BREEDING STOCK	Wednesday, Sep. 24, 2 P.M.
HARNESS HORSES	Thursday, Sep. 25, 2 P. M.
CLASS III—SHEEP, SWINE AND POULTRY.	
LONG WOOLS AND FAT SHEEP.	Thursday, Sep. 25, 10 A. M.
MIDDLE WOOLS	Saturday, Sep. 27, 10 A. M.
MERINOS	Friday, Sep. 26, 10 A. M.
WHITE PIGS AND LARGE BREEDS.	Thursday, Sep. 25, 10 A. M.
BLACK PIGS	Friday, Sep. 26, 10 A. M.
POULTRY	Thursday, Sep. 25, 10 A. M.
CLASS V.	
GRAIN, &c	Thursday, Sep. 25, 10 A. M.
DAIRY, &c	Thursday, Sep. 25, 10 A. M.
DOMESTIC GOODS	Friday, Sep. 26, 10 A. M.
CLASS VI.	
FLOWERS	Wednesday, Sep. 24, 2 P. M.
FRUITS	Thursday, Sep. 25, 2 P. M.

Evening Meetings,

At the Agricultural Rooms (corner of State and Lodge Streets), at 7½ P. M.

SUBJECTS OF DISCUSSION.

Wednesday, September 24, Cattle and the Dairy.
Thursday, September 25, Horses and Horse Breeding.
Friday, September 26, The Sheep and Wool Interests.
Monday, September 29, The Benefits of Improved Implements.
Tuesday, September 30, Pigs and Poultry.

EXECUTIVE MEETING.

August 15, 1873.—Present, the President; Vice-Presidents Curtis, Geddes; the Secretary; and Messrs. Tucker, Lewis, Juliand, Bristol, Holmes, Cocks and Manley, of the Executive Committee.

Letters and excuses for non-attendance were received from Vice-Presidents Thorne, Wing, Doncaster, Wadsworth and Pendry; the Treasurer, and ex-Presidents Campbell and Ingalsbe.

The minutes of the last meeting were read and approved.

The Secretary presented the affidavit of Mr. L. C. Fish, of Otego, N. Y., in relation to the shearing of his Shropshire sheep entered for exhibition, the same having been evenly shorn since April 1st, but not bare, though as closely as Mr. Fish considered safe at the time; and on motion, it was

Ordered, That the entry be admitted and the fact brought to the knowledge of the Judges.

On motion, *Ordered*, That the Executive Officer in charge of the Sheep and Swine Department be charged with the duty of appointing two inspectors, who shall examine all the sheep exhibited, and report any cases of stubble shearing that may be found; and that in every such case the animal shall be disqualified.

On motion, *Ordered*, That in addition to the premium now offered for cider mills—machines combining grinders and presses—two bronze medals be given, the one for a cider mill (grinding only) upon a large scale, the other for a large (detached) cider press.

The following appointments of Superintendents were made:

Cattle—Thomas V. Maxon, Adams. *Horses*—John F. Quick, Suspension Bridge. *Sheep and Swine*—J. A. C. Kellogg, Adams. *Poultry*—Chauncey Boughton, Saratoga. *Implements and Machinery*—Julius W. Smith, Geddes. *Grain, etc.*—G. M. Ingalsbe, Fort Edward. *Dairy, etc.*—H. W. Dexter, Newport. *Fruits and Flowers*—James Vick, Rochester. *Forage*—M. C. Remington, Weedsport.

The Committee proceeded to the selection of Judges, and completed the list.

The subject of furnishing power for light machines to be shown in the Manufacturers' Hall was referred to Vice-Presidents Geddes and Doncaster, with power; and the question of an Inaugural Address to the President, with power.

Adjourned.

ADDRESS

Before the New York State Agricultural Society, at its annual meeting, in Albany, on the twenty-second day of January, 1873—Evening session. By the retiring president, MILO INGALSBE, of Washington County.

Gentlemen—Fellow Members of the New York State Agricultural Society: A short year since you invested me with the highest honour within your gift; and in obedience to mandate more inexorable than law, I meet you to-night to review in brief some of the points in the year's history, including a few suggestive topics, and return to you the insignia of official dignity so reluctantly assumed.

Disclaiming at the outset any idea of ability to impart instruction to the members of the Society, many of whom have been my own instructors from early boyhood, it is with extreme pleasure that I have the opportunity to thank all, absent as well as present, for the very particular consideration and aid vouchsafed to me at the beginning of the official year, without which, as events proved, I could have been of little service. No word has passed or act occurred, during the confusion of a busy year, to interfere with the harmony and cordial experiences of nearly a life-time.

Providence has been benignant. Disease and death have made few inroads in our ranks during the year. The season has been fruitful and ordinarily propitious; though the winter months at the opening of the year were colder than the corresponding ones of several previous years, and the winter upon which we have now entered will be remembered as thus far remarkably vigorous. Local and severe devastations, by wind and flood, have been experienced; and in some portions of the State continued drought interfered with the prosperous growth of crops and herds. With few exceptions, harvests have been bountiful, the supply of grass and forage crops equal to the demand, and the products of our orchards nearly everywhere not only abundant but burdensome.

No contagion or disease has, to any considerable extent, appeared among our flocks and herds. The epizoötic influence at one time occasioned wide-spread alarm, not only within the borders of our own State, but in the Canadian Dominion and throughout the whole Federal Union. Of adult horses, so far as our observation extended, not more than four per centum, it is believed, escaped a more or less serious attack, while about two per centum of cases proved fatal—mainly after a second illness. The ignorance and apathy exhibited by the general public during the prevalence of this disease furnish conclusive evidence (if such were needed) of the importance of an extension of veterinary practice upon a natural and scientific basis, so often and urgently recommended by this Society. The disease, appearing at the closing period of the year's active business, occasioned great delay, inconvenience, and privation. Had the event occurred in April instead of November, the business of the country would have suffered beyond computation.

The Society, since the last annual meeting, has entered upon a new era of its existence, not only in having its charter renewed by legislative action, but in changing its whole policy in locating and conducting its annual exhibition. These fairs or exhibitions had heretofore been located temporarily, for a single year, at different parts of the State, as was judged best for the common interest, deference being paid at the same time to the enterprise and rivalry of competing cities. Temporary enclosures and structures, suitable for the occasion, were erected at the expense of the community where, for a time, the fair was located, with but small outlay from the Society's funds. Forty years of continued prosperity, during which thirty-one annual fairs had been held in various cities and towns of the State, tested well the wisdom and forethought that instituted our organization, the painstaking patience and broad philanthropy that stimulated its beginnings and sustained its growth, until it has reached the proportions we now behold, and become a controlling factor among the forces that give direction to society and tone to nationality.

Those men, the giants of their times, who inspired the primal thought and action of our existence as an organization, might well have paused could they have seen with our eyes what surpasses in fact all they hoped for and all their anticipated ideals. A Society, beginning with few friends, meagre in funds, attracting to itself year by year progressive numbers of the one and substantial accumulations of the other, till its list of Life Members includes the names of more than a thousand of the representative men of the State, and its yearly balance-sheets testify to a healthy exchequer. A Society, whose beneficent and elevating influence is not only felt in and around every village and hamlet, along every streamlet in our broad commonwealth, the acknowledged peer among kindred associations scattered through the great empire of States, but is looked to as an exemplar in all lands where honours attach to civic renown.

During the last decade of years it was becoming more and more apparent that the erection of structures to be demolished after an occupancy of only a few days, was attended with too much waste of force and

material; and that the accommodations thus furnished were not commensurate with the growing wants of the Society, while the burdens imposed upon a few individuals where for the time the fair was located, were not the least of the objections to a continuance of this system. Thoughtful minds, slow in view of past successes, to accept doubtful innovations, after careful inquiries and investigations, evolved a plan of permanent locations for exhibitions at three or more central and easily accessible points in the State, where tasteful and commodious buildings, sufficient for all the needs of the Society, should be erected, whose appearance and surroundings should commend them to the fostering care and laudable pride of adjacent communities, and command the admiration and patronage of every citizen of the State.

Accordingly, soon after the opening of the past year, the Society, through its executive board, issued to the public a formal plan for the initial movement in this direction. The people of several counties in the State evinced a practical interest in the matter and an ambition to secure the proffered boon The county of Chemung, having obtained by legislative enactment the right to levy and collect the sum of fifty thousand dollars upon its taxable property, for the purpose of endowing a location for the Society within her borders, forwarded to Albany an acceptance of the Society's proposition. The Board, after due and careful deliberation, designated the young city of Elmira as the place for the first location under the new regime, believing, in view of the requisitions promulgated, the inducements offered by the citizens of that place more in accordance with their ideal arrangement than those from other parts of the State.

A desirable plot of land, fifty acres in extent, was secured near the city, adjoining the Erie railway; and under the direction of proper committees, aided by accomplished engineers and architects, the work of preparation, enclosure and erection, attended with obstacles of more or less serious magnitude, was pushed with unprecedented vigor. And on the thirtieth day of September, 1872, the gates were thrown open for admittance to a well-arranged exhibition, more complete in all its parts than any one previously held under the auspices of the Society. Though for want of time every detail of construction had not been carried to perfection, the Society has reason for congratulation that its new abiding place is equal, for all its legitimate purposes, to any now known. With the erection of two or three buildings, further, and a few other additions, little else will be desired.

There, in the midst of a beautiful valley, with its young years of civilization all grasped within the memory of a few still surviving pioneers—those memories redolent with the strife and confusion of the chase and war-path, as well as the toil and privation of subduing the wilderness to be the homes of succeeding generations—we have spread the general features of a scene, common-place, indeed, in each detail; but which, if those committees to whom its real fate is entrusted shall, by union of effort and industry in their various spheres of action, touch and fill it out to completeness, will present more of interest to the philanthropist and educator than any mere material superstructure.

We had the good fortune to entertain as guests well known gentlemen of culture and intelligence, representatives of kindred societies from several neighbouring States, who with unanimous verdict awarded us the palm; wondering how we could have done so much with our meagre preparation.

The Society is largely indebted to the Hon. Wheeler H. Bristol, of the executive board, for the timely offer of his personal assistance and varied experience, without which we should have been unable to accomplish the work of construction this year. Also to General Diven, Vice-President, through whose friendly offices (at all times at our command) the Erie Railway Company cordially granted all our needed requisitions. To Colonel Bowen, General Superintendent, and T. L. Harison, Esq., Corresponding Secretary, are also greatly due the successful issue of the undertaking. The former, with his perseverance and well known executive ability, was equal to any emergency; the latter had such well-conceived and digested plans, and his assistants wer· so fully instructed, as to be prepared for every exigency that could arise. Colonel J. C. Cuyler, and his attentive corps of subordinates, are entitled to grateful remembrance for the promptness and gentlemanly bearing with which they ministered to the domestic and economic affairs of the Society. Through their efforts the quarters assigned to business and convenience were plentifully and properly arranged and supplied. For accurate details of plans, cost and condition of superstructure, and of the financial condition of the Society, I refer you to the reports of the Secretary and Treasurer respectively. Legitimate doubts were entertained of our ability to command success. These in a measure disappeared, and our stalls and allotments were nearly all occupied The attendance of people would doubtless have been larger had the "weather probabilities" been more favourable. The attractiveness, accessibility, and ample provision made for personal comfort and enjoyment—so far superior to those of former fairs—will, however, in future swell the throng of pilgrims to our autumnal festival.

The citizens of Elmira and vicinity seconded the efforts of the Society with enthusiasm. The Brot ers McCann and Mr. Suffern, former proprietors of the land purchased, in particular, were assiduous with their valuable advice and assistance. Rarely has the local press been so courteous and persistent in forwarding the aims of the Society, as was that of Elmira. The members of the Farmers' Club, likewise, and specially to be named, its worthy and practical President, Hoffman, and equally worthy Secretary, Armstrong, gave their unremitting attention to the comfort of the officers of the Agricultural Society, making our sojourn there exceedingly pleasant.

Nearly every officer of the Society was at his post during the fair; and all are entitled to thanks for the fidelity with which they each performed their allotted duties. We are fortunate in having our affairs at this time in charge of so efficient a corps of officers. Many of them have long been in the service, and are well proved.

I also tender personal acknowledgments to these gentlemen, several of whom I could wish to name publicly in this connection, for the very friendly and valuable assistance and consideration rendered in the performance of my own duties, thus relieving my position of much of its attendant embarrassment.

Fewer of the ex-presidents and older friends of the Society were in attendance than usual. Their absence doubtless was attributable in part to the remoteness of the place of exhibition, rather than a want of interest. But (and pardon the digression) there is something saddening in the experience we undergo at our fairs and annual meetings. Not only forms and faces that in their lusty manhood were the pride and admiration of our boyhood no longer grace these gatherings; and the magnetic voices that cheered to hopeful deeds are forever silent There remain *other* loved and honoured forms that come with us yet along the silent years: we know the time is near when they, too, must join the comrades of other days, and we shall listen to their words, and welcome their faces no more. They beckoned us onward in our life's young years; stayed our hands and strengthened our hearts by counsel, ex-

ample and encouragement, as maturer years came on apace.

Remembering this, let us by kind and deferential words and deeds so minister to their declining years as to receive their benisons as they slowly glide into the twilight, anticipating likewise that as we give so shall we receive. Many of the political and social organizations of the day give but scope to the selfish and jostling ambitions of the hour, remitting worth and memory to forgetfulness, if only to secure vantage to name and place for remorseless competition. Our association, as often proved, imbibes more of the genius of that primal institution—index of the highest civilization, whose warmest corner and the tenderest solicitudes of whose hearthstone are reserved as the rightful perquisites of its revered and patriarchal leaders.

The necrology of the year testifies to the rich harvest of the mysterious reaper. All the great departments of thought and action are represented in the mortuary list. Our own Society furnishes a Corning, Vail and Lyman, and others whose benefactions and labours in behalf of the Society are well spread upon its records. We are standing to-night by the grave of one who met with us frequently during the year—Mr. Thomas Hall Faile, of New York city, who died suddenly on the 13th instant, at Nice, in Southern Europe, where he was sojourning in pursuit of health. Let others, more intimate with him, more familiar with his inner life, pronounce his eulogy. I can truly realize that our Society and the world have met with an irreparable loss, and that my personal obligations for many and delicate marks of favour and regard conferred by him are more and greater than I can in any way reciprocate. It is the fortune of but few to spend so much of life in unobtrusive, unremunerated and generous toil for mankind.

Since I became a member of your Executive Board, in 1867, we have lost from our councils, a King, Johnson, Taber, Ely. Wadsworth, Foster and Kelly. and to complete the list, ex-President Faile—a galaxy of noble men! Whose turn shall come to follow, is known only where knowledge is without mete or bound. Nor may this occasion pass without a tribute to two individuals whose decease within the year awakened profound regret, not only in our own State, but throughout the national domain, extending to all lands blessed with the light of civilization.

No worthier lesson can be laid before the young men of our time for their contemplation and instruction than the facts in the lives of these men. Of all great achievements of the age and nation, none are grander than the contingencies, facts and arrangements that render the production of such men possible. The one, a friend to all liberal culture, progress, and whatever tended toward elevating the condition of mankind, bestowed upon this Society in its infant years the influence of his gifted intellect and growing fame, and often thrilled our councils with his magical voice. Though in subsequent years duty called him to other fields, he ever had a kind word of remembrance for his co-labourers here. It devolves upon us to cherish the memory of one who went forth from us in time of the nation's need, whose name for diligence, ability, and self-sacrifice in his country's service is enrolled among the illustrious of the age. The other, commencing his youthful career under circumstances of great discouragement, by slow degrees, through indomitable perseverance, integrity, and industry, raised himself to a position of commanding influence. A friend of the toiling masses, he sought with all the resources within reach of his versatile brain, to make the best results of science and civilization available for the benefit of all. Our Society, and the interests it represents, were accorded a large space in the columns of the journal he established and conducted. Believing a successful agriculture in the hands of intelligent and industrious freemen, side by side with like conditioned devotees of mechanical skill, to be the true foundation for good society and national greatness, he gave prominence to the doctrine in that journal; urging its importance with the fervour, ability and steadfastness for which he was eminently distinguished. His voice and pen, with all the ardour of storied chivalry, ever did battle against the wrongs of humanity.

When the genius of history shall have graven her tablets, and coming generations from all lands shall take inspiration from the records of our times, the names of these illustrious dead will be found there traced in ineffaceable lines; or should the time come as has come to epochs of the past, when our government and nation shall have toppled from their exalted greatness; when the pages of their history shall have mouldered into the dust and ruin of centuries; when all movements and evidences of great achievements be buried in the rubbish of ages, with perchance only the names of their great ones preserved in legendary lore, we may rest sure that first and foremost of the classic names then sung will be those of William H. Seward, the champion of progress, the enlightened statesman, the gallant leader in irrepressible conflicts and the expounder of higher laws; and Horace Greeley, the great cosmopolitan, founder of the "*New York Tribune*," and friend of man.

Whatever of doubt and uncertainty may have attended the beginning of our Society, or what the aims and ambitions of its founders and the obstacles in the way of immediate success they encountered, it comes to us in the full plenitude of vigour, with the prestige of years. Not simply a legacy in trust for those who are to follow us, but a responsibility begotten of the necessities of the times. Surely we are not the men to do irreverence to the deeds and memories of the fathers, or stultify the beginnings of promise within ourselves. The plan so wisely inaugurated for the future conduct of the Society, happily proving upon its trial, thus far, reasonably feasible, will with due dispatch, avoiding the errors of the past year, be carried forward to completion. Future locations will be endowed and furnished upon a scale and proportion hitherto unparalleled. The attempt may be made with the fullest assurance.

Formerly we were considered by the many as an organization controlled by and in the interest and caprice of fancy farmers and *dilettanti*. True, these classes of men give largely of their time, means and experience to the Society. The tendency of these later years has been toward more intimate acquaintance between those who labour from necessity or profit and those seeking therefrom relaxation or amusement. Should this tendency continue, as is desirable and very probable, we may confidently anticipate an augmented popularity, and the income from two hundred thousand annual visitors at our fairs. Suggestively, toward this attainable consummation, it may be proper to say here, that developments manifest themselves year by year, from which is apparent the imperious necessity that the awards of judges be so carefully made that the Society shall in no case appear to endorse an inferior or unworthy contribution; and for like reason it is to be hoped that no name will obtain place on our official register that is not itself a synonym for probity.

Our mission being for the improvement and progress of agriculture, horticulture and the household arts, there are numerous agencies indirectly under our control which have an important bearing upon these interests. It might not be proper to interfere in the pro-

cess of legislation, yet much of statute law referring to these subjects is so crude, or has been so many times modified, as to be quite indefinite to the average mind.

When may a well-disposed and law-abiding citizen, on taking up his abode with a new, or, to him, a strange community, find his rights and duties succinctly defined in matters of highway labour, repairs and laying out roads, giving values to be assessed for taxation, drainage of lands with different ownership, determining farm lines and building division fences, the management of estrays and damages arising therefrom, depredations upon enclosures, violations of game laws, of contracts for labour, of sale and delivery, the relation of landlord and tenant, and the obligations of general warranty? More by sufferance than by law are these matters arranged in rural communities. Many times that sufferance does not prevent needless and vexatious litigation. Surely, simple duties of plain citizens admit of plain and simple elucidation.

The citizen just referred to, finds himself perplexed by many of the commercial phases of his situation. He learns that a sack of wool, shorn upon some warm hillside in Livingston county, and sold for forty or forty-five cents per pound, is taxed from ten to twenty cents per pound in its transit to the Eastern manufacturer. A barrel of potatoes grown on the ridges along the upper Hudson, and sold for one dollar, and a barrel of beans pulled upon the sandy loam of Saratoga, selling at the nominal price of seven dollars, are doled out to the hungry consumers in New York at fifty cents per peck for the former, and twenty cents per quart for the latter. The sewing machine, so indispensable to the comfort and culture of the family, manufactured, within an easy day's ride, at a cost of six or seven dollars, is, by some system of commercial regulation that altereth not, warranted for one year, for from fifty-five to sixty dollars. The mower and reaper, manufactured by the scores of thousands on the tributaries of the Hudson and elsewhere, at a cost of from twenty-five to forty dollars for a single machine, is, by the same rule, booked for from one hundred to one hundred and eighty dollars when brought into proximity with the waving fleece of the meadow or golden harvest of the hillside.

Should this citizen and his neighbours, in a season of scarcity, choose to send to the grain fields of the Northwest for a few barrels of corn, to give their beef and pork a condition of early thrift, they find it takes the price of four-fifths of the cargo at the point of shipment to pay transportation and other expenses to the place of destination.

This citizen also finds that his share in the expenses of local and State governments is growing larger year by year; that when, a few years since, the tax rate was one-third or one-half per cent. on his valuation, it is now one and a half to two per cent., with a prospect of still further annual increase. Looking a little further, he sees that the regular diminishing prices of farm produce have already nearly reached the level from which they rose at the commencement of the year of civil strife: but the price paid for the labour to create those products remains at an elevation of one hundred per cent., while the condition of the owner of that labour is not correspondingly improved from that of twelve years since.

Another fact tending in the same direction, bears with equal force upon the idea now developing: Loaning money a few years since, upon securities of real estate or farm property, was not desirable on account of the frequent necessity for reinvestment through prompt repayment of the obligation; now, however, mortgagors find it difficult to keep even their annual balances of interest.

These and similar problems agitate perhaps *less* thoughtful minds than that of our supposed citizen. To him, and to us of purely agricultural pursuits, the whole system from which these incongruities arise is plethoric with days and years of doubt. To my own mind, ere long a solution of these difficulties, or many of them, must evolve from some source, or the stereotyped sentiment regarding the signal prosperity and the contentment of the labouring classes must be taken somewhat shorn of its literalness.

So far from being an alarmist, I believe the ills and antagonisms alluded to, and to which might be added others, are needless blemishes upon our social polity, that in the so-called progress of ideas will be found easily remedied. The farmer's lot, in cases not few, with all the exquisite joys, endearments and memories that attend it, is surrounded under the present organization and extravagant demands of society, by perplexities, hardships and privations, and, moreover, does not always command success.

Following usage, he cultivates his acres too little and undertakes too many of them. This in time necessitates numerous temporary expedients; these in their turn induce similar ones, and so on indefinitely, till his position is not to be preferred to that of the humblest day labourer by his side. To counteract the scarcity and high price of labor, he will be advised to avail himself of improved processes, implements and machinery. This is wise, yet it presupposes the ownership of capital on his part, which supposition is often far removed from fact; then again, these improvements being furnished, there comes in for consideration the unsupplied demand for skilled labour to manipulate them. Now the possessor of fifty or one hundred acres, conducting his plantation for a profit to live by, in addition to the brain work that is properly his, must perform a moiety of manual labor himself. Often he is really the hardest worked member of the force on his farm. This call for additional and expert labour can only be answered, in most cases, in his own person. Already over-tasked, he accepts the situation with a dash and intrepidity that should bring success. Events in their diurnal routine push him onward through his allotted sixteen or eighteen hours of the revolving day, leaving him but little time for sleep and food, less for thought and relaxation, none for the cultivation of those soft, sweet courtesies of life that should hang in luscious clusters around his board, and mingle with the warm welcomes that loiter to bend low at his hearth-stone. Ere long discouragement, distrust, disappointment, discomfort and dismay assert claim to control, and a disheartened household is afloat pilotless on the wild wave of reckless humanity. Thus have I thrown before you a single feature of a scene that is constantly reproducing itself up and down our thousand valleys. Would it were less sombre! And there are delightful pictures, treasures in memory's cabinet; but we are not here to bandy choice epithets, nor may we shut our eyes to the growing needs and wants of our people, those needs being in large measure legacies from worn-out continental communities.

Possibly our system of popular education in its adaptedness to fix the status of the citizen in industrial pursuits is defective; that system in theory has been thought nearly perfect; if this be true, its full development has not been realized. To a plain man it clearly appears that a system of education, based upon the fact that agriculture is instinctive with the human race, and endorsing the doctrine of the "nobility of labour" is a growing need of the times. The present system is sufficiently comprehensive, but its practical application is mainly under the control of professionals; its tendencies, incentives and encouragements are toward so-called professional life, rather than the

collation of facts and principles that guide a people to the source of true national greatness.

Let the individual be taught in early childhood, through the kinder-garten or some like system of primary instruction, to recognize and respect the forces of the Cosmos and their changeless laws, while by the same admirable methods his hand is trained to rare deftness in harmony with the mystic rhythm, and his heart lured into perfect sympathy with the benign and hearty pulses of nature. In years of youth let this symmetrical education of head, hand and heart, be further developed through wise provisions for technical or industrial education. Meanwhile, let us impress the ever intimate relation of each intelligence to the body politic, not as a cormorant to clutch for greedy morsels, but as a busy co-operator in the untiring and ever changeful round of humanities. Thus a public sentiment will be created that shall render impossible many of our present ills. Then will gleam forth anew the altar fires that enshrined the ancient hearth-stone. The homestead, the pride of stalwart sons trained in technic lore, and of cultured daughters ministering at the fountain of domestic purity and love, consecrated to filial joys and to the virtues that surround it with a halo of peace, will send forth strong hearts and skilled hands to arrange, direct and utilize results worth all the argosies of all the East.

Should government enact its laws plainly for the benefit and instruction of the governed; direct and rapid transit routes be discovered between the products of human toil and their consumers; public taxes be levied for payment of legitimate expenses for the common weal, rather than to minister to the selfish ambition or pride of human vampires; the department of public justice in all cases be administered with certainty and with regard to the proprieties due a civilized people; and the management of prisons, asylums and charities made to correspond with the Christian ideas of the age; should office-seekers and middle men in many other avocations become extinct; public honours be conferred as testimonials of confidence, or merited reward for duty done; and violations of public trusts meet with no condonation; the child rescued from worse than Malthusian philosophy; and the household resume its normal position as an integral agency of the living and moving world around us, such benefit would enure to society as ample to compensate all of individual or associate effort requisite for the attainment of ends so desirable. Such a combination would force within our reach all the known resources of applied as well as social science; the earth would indeed come to be regarded as the foster mother of mankind, and such societies as ours as agents and transfusers of her regard.

As at the games of olden times, all that was worthy in Greece was brought together, so through the same inspiration and one-heartedness of the people, our festivals will call from every busy nook of the Empire State the best examples of study and experiment in the development of the various breeds; the most approved and promising specimens of utility, cunning and skill from the factory and workshop; the evidences of an intelligent tillage husbandry, and the improved processes whereby the results were secured, with the attendant contributions to the uses and ever-changing forces of domestic economy. Over and beyond—superior to all—will crowd within our gates an appreciative intelligence, a sterling *man* and *womanhood* that can be produced nowhere but on American soil.

Our annual gathering *here*, will include in its usual programme the discussion of the experiences and unsolved problems of the past, and project theses for study in the coming year. Around our council board, where yet remain the mantles of the Fathers, shall be gathered the representative wisdom of current times, to devise and plan other achievements in the domain of progress. Or, failing to accomplish all that philanthropy would choose or dictate, we may still remember that, to open a new avenue to productive industry, to encourage a single improvement in the processes of human labour, or in the application of force to those processes; the discovery of an improvement in breeds or races of domestic animals, or a single new or serviceable characteristic in any of the extant breeds, or the elucidation of a principle, by the application of which the adaptedness of an animal to the uses of the human race may be better understood; the production of a new grain, grass or vegetable for the sustenance of man or animal; the impression of a vital or æsthetic thought upon community or individuals; any suggestion through or by which the springtime of youth, from its emergence from school days till entrance upon business, now spent, under the doubtful sanction of effete usages of society, in worthless and harmful inaction, may be devoted to intelligent thought, culture and soul-inspired action; continued and systematic observations of the phenomena and laws of the air, the sunshine, the wind, the wave, heat and light, the cloud and the lightning, that if brought within the comprehension and control of man, will conduce to his security or happiness; the discovery of a new fertilizer for the benefit of the husbandman, or a more favourable mode of applying those already known; the elimination of any of those secrets embedded in the earth or ocean, for long ages awaiting the magic word that shall range them alongside the forces that create and give life, love and joy; the planting a shade or rearing a fountain by the wayside for invigorating the weary traveller; opening of tasteful public parks and pleasure grounds for the comfort and enjoyment of earth's toilers, and where the star of hope may gleam on the unfortunate—or larger still, securing boundless wood and shade, hill and dell, lake and mountain fastness, to be consecrated to healing and rejuvenating the nations down the sluggish centuries; or the propagation of a new berry or fruit, with luscious juice to tempt the palate; or a new flower, a *rose* if you please, with its beauty and fragrance—*one* or *all* of these are foretastes of the abounding joys that underlie and encircle the healthful couch only of benefactors of mankind.

Thanking you again, gentlemen, for your kind and flattering attention, and bidding you an adieu, I come to the performance of my sole remaining duty as your presiding officer—the presentation of my successor, a gentleman well known to you to possess in an eminent degree the ability and ambition to excel in the execution of all that shall be required of him in the exalted and honourable position to which you have called him—the Honourable Benjamin F. Angel, of Livingston.

ON THE DAIRY-FACTORIES OF SWEDEN.

By M. Juhlin-Dannfelt, Superintendent of the Experimental Farm and Agricultural College at Stockholm. (In two letters to the Editor.)

From the Journal of the Royal Agricultural Society of England, Vol. vi. 1870.

Previous to laying before you the information which I have obtained, at your request, on the subject of Swedish dairy-factories, I must in a few words direct your attention to several circumstances, peculiar to our country, which exercise an essential influence on its farming, and especially on the keeping of cattle.

I take the liberty first, to refer to a short description of the agriculture of Sweden, which I have furnished at the request of my friend Mr. James Howard, and which you will find in No. 1985 of the "*Mark Lane*

Express." You will see from it that the greater part of the land of Sweden is divided into small farms, which are cultivated by the peasants owning them, and on which the number of cows kept for breeding, or for the production of milk, seldom exceeds ten or fifteen. The quantity of milk obtained on these farms is therefore small, especially as the animals generally receive insufficient nourishment during the long winter. One consequence has been that, as large quantities of milk are indispensable for a regular and rational method of dairying, this branch of husbandry has not until lately been developed to any considerable degree, although the climate, the nature of the country, and the manner of living of its inhabitants, are all favourable to its advancement.

In order to further this object, various measures have been taken during the last ten years, both by the Government and by the agricultural societies, and efforts have been directed towards drawing the attention of the small farmer to the advantages to be gained by the application of the idea of association to this branch of husbandry. These endeavours are, however, of too recent a date to have as yet produced any very obvious results; but from what has already been gained, it is evident that the dairy-factories constitute the most powerful means of obtaining on small farms a considerable revenue from dairy-produce. The price which the milk has realized by such associations, greatly exceeds what the small farmers—especially those in the northern provinces—have hitherto been able to obtain for it single handed. The system is therefore gaining ground daily, and is exercising a beneficial influence on this class of farmers, as well as stimulating a more careful treatment of the cattle; and this influence is already reacting in a salutary manner on other branches of agriculture.

The modes in which dairy-factories have hitherto been arranged vary in different places. In some districts a person—generally some tolerably wealthy farmer—purchases, at a certain price, the milk produced on neighbouring farms, and subsequently prepares butter and cheese from it; the owners or tenants of the farms taking no part either in the profits or losses. In other places on the other hand where more agreement and confidence prevail between neighbours, several persons residing within the same village, or in each other's neighbourhoods, have established a dairy-factory, which is worked on the account of all the proprietors, and the profits of which are divided *pro rata parte*. The best results have been obtained by the latter method; and it will, beyond doubt, become the more general, being of incomparably greater advantage to all concerned.

After these brief introductory remarks, I now proceed to answer your queries.

1. *Average number of cows.*—From 50 to 200; the average number about 100. Experience has, however, proved that wherever a factory has been established, the number of cows has speedily increased.

2. *Size of buildings.*—This depends to a great degree on local circumstances, and the system followed in the management of the milk. Most of the dairies are managed according to the so-called cold-water system, by which expensive cellars are avoided. Such a dairy generally consists of a building from 50 to 60 feet long, and from 25 to 35 broad, containing a milk-room (being either a cellar, on the Holstein system; or, where the cold-water system is introduced, a room with splint walls and a water reservoir); a curd kitchen, where the cheese is made; a cheese room, where the ready-made cheese is kept and ripened; a butter-cellar, and one or two dwelling rooms. There are, besides, in several dairies a churn room and a room used for the sale of part of the milk, where either the skimmed or new milk, or the buttermilk, is disposed of directly from the dairy. Most of these dairy-houses are built of wood.

8. *Cost of buildings.*—The cost of such a building greatly depends on the price of the timber and the labour, the disposition of the interior, etc., etc.

Thus, in the northern provinces, where there is an abundance of timber, and where the labour is generally performed by the associates themselves, it is stated not to exceed 50*l*. to 70*l*.; but in the middle and southern provinces, on the other hand, it probably amounts to from 120*l*. to 150*l*.

4. *Cost of machinery.*—The machinery is generally exceedingly simple, especially in the northern provinces. There it is stated that this cost amounts at the most, to only 15*l*.; in the middle provinces, to from 30*l*. to 50*l*.; and in the southern, to as much as 100*l*., in which, however, are included a boiler, with a system of tubes or pipes leading to a double-bottomed curd-tub, a hot-water tub, etc., a churn with a horse-gear, English screw-lever cheese-press, etc., etc.

5. *Capital invested.*—In most cases the requisite capital for the construction of the buildings and the purchase of the machinery, is obtained by loans from the respective agricultural societies. These loans vary between 60*l*. and 300*l*., and are to be repaid by annual payments within 5 to 10 years, being partly exempt from interest, and partly not. In the case of a company raising the loan, all the shareholders are liable for the same.

6. *Work-people employed, and wages.*—For the management of a dairy-factory one woman and a maid are generally sufficient.

In some dairies a man-servant is employed besides, to perform the more heavy labour, and to convey the products to market; this, however, is an exception. The wages of the dairy-woman amount to from 6*l*. to 9*l*. per annum, besides 12 bushels of rye, 12 bushels of barley, several bushels of potatoes, and 1¼ bushels of peas, and milk, butter and cheese sufficient for her own wants; or, in some cases, a certain amount of the two last-mentioned articles. The wages of the maid amount to from 3*l*. to 4*l*. 10*s*. in money and somewhat less than the dairy-woman in natural products.

7. *Quantity of milk received.*—This quantity has hitherto varied greatly, being from 10,000 to 25,000 gallons a year. A considerable quantity of the milk produced on the farms of the partners of the factory is consumed in their own households, especially during the summer, when milk is the general drink of the people. The quantity delivered to the factories is, however, continually on the increase.

8. *Distance, maximum and average, from which the milk is brought.*—The average distance is about one English mile; maximum, 10 miles. When the making of butter is the chief object of a factory, it has been found that in order to obtain a good result, the milk should be carried to the dairy, and not conveyed in a cart, because less butter is always obtained from milk that has been shaken. The distance should therefore, in such cases, not exceed one mile.

When cheese is to be made, the milk may, on the other hand, be brought from far greater distances, taking care only to let the milk get well cooled previous to transporting it.

9. *Quantity of cheese made per annum.*—In general, nearly whole milk cheese is made during the summer, and butter and skimmed-milk cheese during the winter. By one of my reporters it has been stated that, on an average, dairy-factories at present produce from 500 to 4,000 pounds of butter, and from 2,000 to 8,000 pounds of cheese.

By one dairy-factory it was stated that, in 1868, 3,820 gallons of milk were used in making butter;

9,830 gallons of milk were used in making new milk cheese; and 2,430 gallons of milk were used in making skimmed-milk cheese. The quantities of cheese and butter obtained from the above amounted to

1,640 English pounds of Cheddar cheese;
6,660 " " Swiss cheese (Emmenthaler);
1,725 " " skimmed-milk cheese, and
1,385 " " butter.

With regard to the dairy-factories in the northern provinces it is stated that, on an average, 2 "kannor" of milk (1.15 gallon) are needed for one Swedish pound (15 ounces avoirdupois) of fat cheese, and 5 "kannor" (2.8 gallons) for 1 Swedish pound of butter.

While the cattle are feeding on the rich pastures of the mountains, no more than $3\frac{3}{4}$ "kannor" are required for one pound of butter, and $1\frac{1}{4}$ "kannor" for one pound of fat cheese.

10. *Charge for making, and mode in which the charge is made.*—In the north, where the cost of fuel is not reckoned, this charge is stated to amount to from 1 to 2 öre;* in the middle provinces to $2\frac{1}{4}$ öre; and in the southern to 3 öre per "kanna" of milk, all the costs of management being included in this.

11. *Disposal of the whey.*—In the north, where the whey is of very little value, it is used for making butter and cheese, which fetch from 12 to 15, and even 18 öre per pound. In other parts of the country the whey is mostly given to pigs, and in that case realized at a much lower rate, scarcely one öre per "kanna." It has, however, of late been used also for feeding calves.

12. *Average dividend to the proprietors of the factory.*—The average price of the milk sold at the factories owned by companies, has amounted to 20 öre per "kanna," and sometimes to much more, having even exceeded 26 öre per gallon.

To what I have previously stated regarding the dairy-factories, I beg to add some notices respecting one which was little known when I last wrote to you, but which has now attracted general attention.

A farmer who resides in the neighbourhood of Stockholm, and who, though almost blind, has nevertheless devoted himself with unshrinking energy and great perseverance both to the theoretical study and the practical management of butter and cheese-making, commenced a few years ago purchasing milk from neighbouring farms for making butter, the skim-milk being partly sold in the markets of Stockholm, and partly made into skim-milk cheese. The favourable result of his endeavours caused him gradually to extend this business, for which purpose, and in order to obtain an easy sale for the buttermilk, he established a central dairy in the capital, to which cream was brought from the numerous places where the milk was received from neighbouring farmers; the unsold skim-milk, on the other hand, being made into cheese at the places where the milk was delivered, and where branch dairies were erected.

This business has, within a few years, been extended to such a degree that during this spring the quantity of milk purchased by the farmer, and employed in the above-mentioned manner, has amounted to 4,000 gallons per day. During a previous year he had associated with himself a capitalist, likewise warmly interested in this branch of husbandry.

The production of milk, however, being constantly on the increase, and its price having on account of that considerably diminished, the partners have now decided upon transferring the entire business to a limited company, for the purpose of extending it in such a manner as circumstances may require and render profitable. Of this company they themselves are the largest shareholders. Feeling a warm interest in the development of this industry, so important to our agriculture, and being likewise a shareholder of this company, I have taken an active part in its organization, and am therefore able to give trustworthy information relative to this dairy-factory, which perhaps may prove of some interest to you also.

The object of the company is to purchase milk at different places situated within the provinces surrounding the Lake "Mälar," for the making of butter, cheese and other dairy products, partly on the spots where the milk is delivered from the surrounding farms, and partly at the central dairy at Stockholm. The branch factories are to be established partly near railway stations in daily communication with the central factory, and partly at places from which a daily communication with the capital cannot be reckoned on all the year round, and which latter, on that account, must be so arranged as to be able to carry on a more independent existence.

All these dairy-factories are under one and the same direction, consisting of five shareholders annually elected at the general meeting of the company, among whom the chairman and the managing director must reside in Stockholm or its neighbourhood.

The salary of the chairman amounts to 1,000 Sw. dollars (55*l.*); that of the managing director to 5.000 Sw. dollars (275*l.*); and that of the three other directors to 500 Sw. dollars (27*l.* 10*s.*) each.

The board of directors authorizes both the purchase of the milk and the manner of employing the same, as also the sale of the manufactured produce. The board appoints and dismisses the assistants and clerks.

The managing director has to effect the purchase of the milk and the selling of the produce, both, however, in conformity with a plan previously drawn up by the board of directors. He alone engages and dismisses workmen and women, both at the central and the branch dairies.

The board of directors meets once a month at least, the chairman exercising a general supervision in the intervals. To other members of the board is committed the superintendence of certain districts, according to a division agreed upon between themselves

Branch dairies at places which are in daily communication with the capital all the year round, are established by the board of directors whenever and wheresoever they find it advisable.

The establishment of branch dairies in districts which are deprived of daily communication with the capital, requires more direct co-operation between the company and the neighbouring dairy farmers; but such dairies are always established as soon as sufficient means, by subscription for shares, have been obtained at the place, and a guarantee has been given for the delivery of the requisite quantity of milk. The annual profits of the company, after all the expenses and disbursements, as well as salaries, have been paid, and 20 per cent. of the value of the plant has been deducted, are to be disposed of in the following manner:

(*a*) Six per cent. interest is to be paid to the shareholders on their presenting the coupons of interest.

(*b*) Of the remainder, one-tenth is to be set apart for a reserve fund, which, in the event of a bad season or other circumstance causing the balance to be so small as not to cover the interest at the rate of six per cent. on the shares, may be employed in supplying the deficiency.

(*c*) What thereafter remains is to be divided between the directors, the shareholders and the purveyors of the milk in such a manner that the directors receive one-fourth, and the shareholders and milk-purveyors the remaining three-fourths.

* The kanna is 4.7 of the English Imperial gallon, or 0.68576 of the New York standard gallon. Seven öre are equal to one English penny.

(*d*) The amount falling to the share of the directors is divided in such a manner that the managing director receives one-half, the chairman one-fourth, and the other directors the remaining fourth, to be divided in equal shares among them.

(*e*) The division of the balance between the shareholders and the purveyors of the milk is made so that those purveyors who have furnished the factories during the whole of the previous year with milk to an amount of not less than 5,000 "kannor" (2,900 gallons), shall, for each 2,500 "kannor" (1,450 gallons) delivered at any dairy of the company, partake in the division equal to one share.

The milk from the different farms that have entered into contracts with the company for the delivery of the produce, is conveyed every morning and evening, immediately after the milking, to the nearest of the sixty stations at present fixed by the company for receiving the milk. It is there poured into tin vessels holding about 14 "kannor" (8 gallons), 20 by 13 inches each, which are placed in water, cooled so as to be from 36 to 40 degrees Fahrenheit, and are left there until the cream has risen.

The skimmed cream is conveyed by railway or steamer (during the winter also on roads) to the central factory, where it is made into butter in five churns worked by a steam engine of 4 horse-power, by which 5,000 pounds of butter can be churned per day.

At some of the branch factories, where at least 500 gallons of milk per day may be obtained, the company intend to try the production of Cheddar cheese, but at present that description of cheese is not made.

The butter is exported; the skim-milk cheese, prepared in the Dutch manner, finds a good market at home. With regard to the quality of the butter, the most flattering testimony has lately been received from London factors.

The capital of the company is fixed at 55,000*l*., but as soon as 8,000*l*. were subscribed—which was done in two days—the company commenced its operations.

The calculation on which the company was formed is abridged as follows:

Receipts.

	Dollars.
Supposing that 3 million "kannor" milk (= 1,700,000 gallons) are furnished per year, and that 5¼ "kannor" of milk (= 3·0 gallons) are requisite for the production of 1 pound of butter, 545,000 pounds of butter will be obtained, and sold at a price of 85 öre per pound (= 11·3 pence per Swedish pound) which will yield	463,250
From 3 million "kannor" milk, after deducting the cream and the evaporation, 2½ million "kannor" of skim-milk are obtained. Of this milk, about 2000 "kannor" per day, making 600,000, "kannor" per year are sold in the capital at an average price of 15 öre per "kanna" (= 3·6 pence per gallon), after deducting the commission, which makes.	90,000
Of the remaining 1,900,000 "kannor" of skim-milk, calculating that 2½ "kannor" of milk are requisite for the production of 1 pound of cheese, 760,000 pounds of cheese are obtained, making at 22 öre per pound (= 3*d*. per pound)....	167,000
Of the cream employed in the making of the butter, viz.: 500,000 "kannor," 250,000 "kannor" are left after the churning, making, at 8 öre per "kanna" (about 1*d*. per gallon), at which price this buttermilk is sold in the capital....	20,000
Of the milk employed in curding, 85 per cent. is left in the form of whey; consequently of the above stated 1,900,000 "kannor" of skimmed milk 1,600,000 "kannor" of whey would be obtained. Whey is here generally used as food for swine, considered worth 2 öre per "kanna" (= ½*d*. per gallon), which in this case would be equal to a sum of $32,000; but in this calculation we have only considered it as equal to the amount that may be required for fuel at the branch factories, and for the covering of unforeseen expenses.	
Total receipts (40,713*l*. 15*s*.)....	*740,250

Expenses.

	Dollars.
For the purchase of 3 million "kannor" milk, the price of which is at present 19 öre per "kanna" (= 4½*d*. per gallon)....	570,000
Annatto, salt, spices for the cheese, rennet, barrels, etc....	12,500
Ice for cooling the milk; average price ¼ öre per "kanna" milk (= 1-16*d*. per gallon).	3,750
Wood and coal employed at the central factory,	1,000
Salary of the directors at the central factory,	7,500
" clerks in the office....	10,000
" 10 mechanics and man-servants..	6,000
" 5 traveling controllers....	5,000
" 20 dairymaids at the central factory....	7,000
" 60 dairymaids at the branch factories....	15,000
Rent and hire of buildings....	10,000
Seven horses at the central factory....	5,000
Other costs of carriage and transports....	30,000
Amortisation of the expenses of buildings, machinery, etc....	10,000
Sundry expenses, such as writing materials, postage, medical attendance, etc....	2,000
Total expenses (38,238*l*. 15*s*.)....	695,250
Surplus (2,475*l*.)....	45,000

The attention this enterprise has here called forth, has given rise to proposals for the forming of several similar companies within different parts of this country, to which result perhaps also your very interesting description of the cheese factories in North America, translated by me into Swedish and lately published, has not a little conduced.

ON THE SWEDISH BUTTER FACTORIES, AS ADAPTED TO SMALL FARM DISTRICTS.

By M. JUHLIN DANNFELT, Superintendent of the Royal Agricultural College at Stockholm, and Honorary Member of the Royal Agricultural Society of England.

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As already stated in my last communication, the Mälar Lake Dairy Company, Limited, the first dairy company in Sweden, was founded upon the principle of purchasing milk for cream setting; the cream obtained at the district milk-houses was transported to butter factories, while the skim milk was either sold in the capital in its crude state, or made into cheese at the milk-houses.

At the commencement of the operations of the company great difficulties were experienced in exercising proper control over the treatment of the milk at the several receiving-houses; and they naturally increased as the operations of the company became more exten-

* Equal to $197,868.82 U. S. (gold) currency.

sive. The books having been balanced at the close of the first three months' operations, on the 31st of December, 1870, it was proved that the results differed at the various milk-houses—at some they were profitable, at others disadvantag·ous. The latter result had probably been caused, partly by disregard of the rules for the treatment of the milk after delivery, and partly by insufficient check as to the quality of the milk delivered. The company, therefore, decided that its operations should be confined to the purchase and working of cream—not milk—leaving it to the producer or purchaser of the latter to utilize the skim-milk in the manner which, under different local circumstances, he might consider most profitable.

This step has proved to be very advantageous to all parties concerned. It has decidedly promoted the further development of the factory system, and at the same time opened the way to a useful and profitable branch of industry to those who occupy themselves with collecting pure milk from the smaller farmers—whose produce is too limited to allow the cream obtained from it to be treated in the manner which will make it saleable to the dairy company,—or from such larger producers of milk as do not care to take the pains necessary for obtaining the cream, or for the further preparation of the skimmed milk.

Collection and Treatment of the Milk.—Experience has proved that cream cannot generally be kept longer than fifty hours in the summer, and from seventy to eighty hours in the winter, without affecting the quality of the butter.

The butter factories of the Mälar Lake, and other companies, do not receive less than 10 "kannor" (=5.76 imperial gallons) at a time, for reasons mentioned below. The consequence is, therefore, that a farmer whose herd does not number at least twenty cows cannot deliver the cream direct to the company. The greater part of the country being divided into small farms, on which the number of cattle does not reach this minimum, the company has established milk-houses in large villages or other suitable localities, thus giving even the smallest farmer an opportunity to dispose of his produce advantageously. The milk is carried, or otherwise transported, to these places every night and morning, immediately after milking, from the farms not more than 1¼ English miles distant. It is first measured and then skimmed by the woman in charge of the place, who enters the quantity delivered. According to her book the farmers receive payment, at the end of every month, for the quantity of milk delivered during the previous month. When the milk is measured, a sample is put into a graduated cylinder of glass, and is left for cream-setting with the remainder of the milk, so as to give an idea of its quality. This is the only control exercised over the honesty of those who deliver the milk, and although it is not very satisfactory, it has hitherto generally answered its purpose.

The milk-houses, in which the skimmed milk is not further prepared, consist of one room or boarded shed, large enough for the pools or cisterns in which the milk is cooled. Next to that is a kitchen, with a boiler for cleaning the vessels, as well as one room for the dairy-maid. When cheese is made, another room is required for pressing and salting, as also a cheese store, and a smaller room for keeping the ingredients necessary for this process. The kitchen, in which the curding is done, and the room or rooms inhabited by the dairy-maids who receive and prepare the milk, must also be larger than in the previous class. These houses are generally very plain, and as a rule are arranged in buildings erected for other purposes, but adapted to this. The rent varies from 50 to 200 rix dollars (=£8 to £10 sterling) per year.

The persons who, as above stated, take charge of the purchase of milk as arranged by the company, pay as rent for the houses which belong to the company an amount equal to six per cent. interest upon their cost, and for others the whole amount of the rent charged to the company.

For coolling the milk, square cisterns, or oval tanks, are used, both being 24 inches in depth. Their other dimensions depend upon the quantity of milk to be strained at one time, and upon other circumstances.

Cisterns, manufactured at the carpenter's shop of the company, are made of planks two inches thick, and inside nine feet long and eight feet wide. Such a cistern is large enough for cooling about 200 "kannor" (=115.2 imperial gallons) of milk. A loose grate, provided with a three to four inch wooden wedge, is fastened to the bottom inside the cistern. The pails for setting the milk are placed upon the grate, thus allowing the ice-water perfect access under the pails. The milk-pails, or tubs, are made of iron or steel-plate, and thoroughly and carefully tinned inside and out. Originally, when the milk was cooled by cold water from wells, these pails had a diameter of eighteen inches and a depth of twenty-four inches. By long and careful experiments, it has been ascertained that the more speedily the milk is cooled down, the more completely is the cream separated from it. The consequence is, that not only is much colder water now used for coolling the milk, but the pails for setting it have also been reduced to the smallest diameter, consistent with the other management of the milk, namely, about nine inches, thereby with a depth of twenty inches, holding about six "kannor" (=3.5 imperial gallons").

In order to be able to use the original pails, their bottom has been taken away, and the sides pressed together, giving the pail an oval shape, with a small diameter of seven inches, and providing them with new bottoms. The coolling power of these pails has thus been greatly increased, and many farmers prefer them to the smaller cylindrical ones, as being comparatively cheaper, and the milk in them easier skimmed.

Besides changing the form of the pails in which the milk is set and cooled, other attempts have been made to quicken the coollIng by using iced-water instead of well-water. The temperature of the well-water is not lower than that of the soil, or from 42.8° to 44.6° Fahr., whereas the temperature of water in which ice, chopped in small pieces, is permitted to melt, may easily be reduced to 35.6° or 39.2° Fahr. Cold wells are not always to be found, but, on the contrary, are very rare in some districts, whereas ice may be had in our northern country generally at a very small expense. The ice-water-method is, therefore, now used at all the milk-houses, as well as by nearly all the farmers who furnish the company with cream.

While constant change of the well-water, where such is used, is required, in order to retain a low temperature, the ice-water does not require to be changed more than a few times each year. The surplus water arising from the melting of the ice is let out by a small pipe placed at the upper edge of the water-tank. The ice is stored in pyramidal piles placed in a shed, or, more generally, in the open air covered with sawdust, tanning bark, peat-soil, or other material which does not conduct heat. As small spaces as possible are left between the ice-blocks, and all intervals are carefully filled with sawdust.

A roof of deals, placed on posts, will greatly facilitate the preservation of the ice. The foundation of the pile is a layer of the same material as the covering, one foot thick. The ice-pile is always opened at the top; and spaces caused by the removal of ice, or the sinking of the pile, must be carefully filled up.

Experience has proved that the loss caused by melt-

ing, when the pile has been properly taken care of, does not amount to more than 25 per cent. per annum, and, very commonly, ice remains in the pile from one summer's end to the other.

The quantity of ice required at the milk-houses is calculated to be equal in measurement to the quantity of milk for the coolling of which it is intended; but with proper management two-thirds ought to be sufficient. At the churning-places the quantity of ice required varies according to local circumstances. At the central factory at Stockholm, for instance, during the summer of 1871—June to September—1,500 cwts. of ice were used in churning 180,000 "kannor" (=103,680 imperial gallons) of cream, yielding 2,500 cwts. of butter, all round numbers. The ice intended for the coolling cisterns is chopped in pieces of about three to four inches square, whereby its coolling power is greatly increased.

The milk should be delivered as soon as possible after the milking is done, and carefully transported; and it has hitherto been considered advantageous to cool the milk during the process of milking and before being delivered. However, it has recently been stated that the more the original heat is retained, the more cream will the milk yield, as the cream begins to rise as soon as the milk begins to get cold, and the straining and transportation of the cool milk causes a very injurious interruption in the rising of the cream, which consequently will be imperfect. This seems very probable, but can only be proved by careful experiments.

It is, however, a fact that the shorter distance the milk is transported the more cream does it yield; other circumstances, as quality, treatment, etc., being the same. As soon as the milk is strained into the pails, they are placed in the ice-water cisterns, at a distance of about three inches from each other. Experiments have been made to ascertain the proper height of the ice-water, but have not led to any positive results. It may, however, be stated that, during the summer season, and when the temperature of the milk-room is comparatively high, the surface of the milk should be on a level with the surface of the water, the upper layer of cream being thus kept as cool as possible; whereas during the winter season, or when the temperature of the coolling-room is low, the surface of the milk should be a few inches above that of the water.

The temperature of the coolling-room ought to be kept as low as possible during the summer season; but, if possible, never below 50° Fahr. during the winter. The time required for the cream to rise depends principally upon how soon the milk is cooled, but also upon the temperature of the milk when being skimmed, as well as upon that of the ice-water and of the room. If a milk pail, say of six "kannor," be placed in the ice-water cistern immediately after the milking, and the temperature of the water does not exceed 35° Fahr., the milk may usually be skimmed after a lapse of ten or twelve hours; but it is better and safer to permit the milk to stand from eighteen to twenty-four hours. At this low temperature, the cream rises very suddenly, but is at first very thin, and requires a longer time to become firm.

At farms from which the cream is sold to butter-factories, it may, therefore, be profitable to sell only the upper and thicker cream, and to churn at home the lower and thinner, thus saving a certain quantity of buttermilk. The cream which is not sent to the butter-factory immediately after being skimmed off, ought to be put into the ice-water bath without delay. It ought not to be kept more than two days during the warmer season, and three days during the winter, before being churned, as it otherwise will become bitter, or acquire a bad taste easily detected in the butter. It may be considered as a fact, that the fresher and absolutely sweeter the cream is, the better will the butter be.

As above stated, no smaller quantity of cream than ten "kannor" (=5.76 imperial gallons) is received at the churning-houses of the dairy companies, the principal reason being that, as the cream is paid for according to the quantity of butter it has yielded, each delivery of cream must be separately churned, and that consequently smaller quantities of cream cannot be received without causing too much trouble; besides, it very often happens that larger quantities of cream yield comparatively more butter than when only a few gallons have been churned, although in both cases suitably-sized churns have been used.

The cream obtained from the milk cooled by ice-water is, as above stated, thin, and generally not as settled as that which rises from milk set in bowls or flat vessels, and kept in a comparatively warm room, and as a smaller quantity of butter is obtained from thin cream than from thick, the opinion is often expressed that the first named method leaves a less satisfactory result than the latter.

It will easily be understood, however, that this is not the case, if the merit of one or the other method is estimated by the quantity of butter obtained from a certain quantity of milk instead of cream. Nevertheless, it is true that the thin cream obtained by the ice-water method will give more buttermilk, as well as somewhat less skimmed-milk, than that obtained by the well-water method, the cream-setting in both cases being equally as perfect; but the loss, in itself insignificant, is more than covered by the finer quality of the butter, the better skim-milk, and the smaller expense for vessels and buildings required for the keeping of the milk during cream-setting, besides the other advantages of the ice-water method.

On an average, during 1871, at the central factory, 4.60 "kannor" (=2.65 imperial gallons) milk have yielded 0.76 "kannor" (=0.44 imperial gallon) cream, from which has been obtained one Swed. pound (=0.93 Eng. lb.) butter; consequently six gallons of milk would yield, at this rate, one gallon of cream, although it must be observed that the milk has often been skimmed after standing only twelve hours. At the same place, milk purchased from neighbouring well-managed dairy farms, has required the cream of five "kannor" (=31.5 lbs.) milk to produce one pound of butter; whereas the cream churned on the farms has only required 4.25 to 4.80 "kannor," or 26.7 to 30.2 pounds of milk per pound of butter obtained. The transport of the pure milk, for however short a distance, always causes a smaller yield of cream and butter.

Through the influence of the dairy-schools, organized by the government, material improvements in cheese-making have lately been introduced, so that the present product is universally acknowledged to be of a superior quality; and hitherto there has been no lack of home demand.

An over-production of this article, and more especially of skim-cheese, will undoubtedly take place, considering the progressive development in the breeding of cattle, and particularly in the products of the dairy, which is now taking place in Sweden. The government has, therefore, sent out able persons to investigate, and to introduce, such modes of proceeding as may facilitate the sale of skim-cheese, even in foreign countries.

A more profitable manner of utilizing skim-milk than the manufacture of cheese, is the rearing and fattening of calves. Numerous trials made during the past year, and particularly in fattening, have given very satisfactory results. The calves have at first received some gallons of new milk, and afterwards as

much skim-milk as they would take, until about two months old, when they have been sold at a price equal to about 3*d*. per pound, live weight, or a little less than calves fattened with new-milk. The skim-milk has thus realized 2.3*d*. to 3.5*d*. per gallon, in some cases 4*d*. per gallon. It has been remarked that the colour of the veal has been somewhat darker than that of calves fattened with new-milk; but this is pretty well prevented by giving the calves new-milk for two weeks immediately before slaughtering them. Even if the veal of calves fattened with skimmed-milk is inferior to that of new-milk calves, both to appearance and taste, the former mode of fattening them is, at all events, much less expensive than the latter. and leaves a more profitable return. In breeding cattle for dairy purposes, the above-named inconveniences are of no consequence; and many farmers even in the vicinity of Stockholm, where cattle rearing formerly did not pay, have adopted this cheaper way.

Another reason is, that higher prices are now obtained for cattle, partly in consequence of the increased export to foreign countries of late years, and partly owing to the larger return from the cattle, since the butter factory companies have rendered it possible for the farmers to produce and sell, advantageously, milk in any quantities.

Yet another way of utilizing some part of the skim-milk more favourably than by cheese-making is to give the servants who are entitled to new-milk, twice, or even three times, the amount of skimmed-milk. This exchange is as profitable to the farmer as to the servants, as the former retains the more valuable cream, and the latter receives a larger quantity of a nourishing drink. The price paid for new-milk by the purchasers who have delivered cream to the company has varied between 3.9*d*. to 4.3*d*. per gallon during the summer half year, and 4.3*d*. to 5*d*. per gallon during winter, according to circumstances. 4.3*d*. may be considered as the average price at which the milk has been delivered at the place of production, or at stations situated not far form it. Where the cream has been delivered direct to the butter factories, the price which the milk has brought has depended upon the price paid by the companies for the cream (according to the quantity of butter it has yielded), and the way in which the skim-milk has been utilized, varying between 4.6*d*. and 6.9*d*. per gallon.

The Purchase and Working of the Cream.—When the Mälar Lake Butter Factory Company began its operations, October 1st, 1870, it took charge of a butter factory which had been existence for some time. The intention of the company was to establish butter factories in the provinces situated round Lake "Mälaren" (hence its name); and this has been realized during the past year in the cities of Nyköping, Eskilstrina. Orelero, Westeras, and Noertelge. Each of these branch factories is managed by a skillful person, enjoying the confidence of the neighbouring farmers. This man has a salary of 5*l*. 10*s*. sterling per month, and 20 per cent. of the net profits of the factory.

In consequence of the advantages which farmers, located in the vicinity of the churning-places of the Mälar Company, derive from their operation, applications have been made from nearly all parts of the country, desiring the company to extend its operations, and establish churning-places in other districts. The difficulty of satisfactorily controlling a large number of these places, scattered at large distances from each other, made the company hesitate to comply with these requests, further than offering to advance the necessary funds, either to private persons of good standing, or to associations specially formed for the purpose, who would be willing to establish factories upon the principles of the company. They also engaged competent persons to establish the factories, and qualified ones to manage the manufacturing, as well as dairy-maids, and they provide vessels and other necessary implements. The company also sell the manufacture, charging a commission of three per cent. on the butter produced. Sixteen such agreements have already been made.

The success of the Mälar Lake Company has also caused the establishment of several competing companies for the same purpose, of which seven have up to this date commenced operations. They have hitherto manufactured only small quantities of butter, but if they are well managed, they will gain the confidence of the public, and be able to extend their operations.

Butter Making.—A temperature of the cream of 57.2° to 60.8° Fahr. has been found the most suitable for making butter, but it depends somewhat upon the quality of the cream, the nature of the season and the temperature of the air, etc., etc. The churns which are most adapted for working by steam or water-power, consist of a barrel, somewhat conical at the top, resting on a frame, and vertically movable on trunnions. In this barrel a churnstaff. provided with two wings, rotates at a speed of 120 to 180 revolutions per minute, depending upon the size of the churn, which generally contains from seventeen to sixty gallons, and on the quantity of cream to be churned. The butter is obtained in about forty-five minutes. It is separated from the buttermilk by means of a strain, then placed in a tub of tin, and carried to the next room, where it is further prepared. The butter obtained from each separate quantity of cream is then worked by hand in a beech-wood trough of oval form, in order to separate the buttermilk It is then tasted by the managing dairy-maid, and classified according to its taste and other qualities in three classes, and afterwards weighed, the weight and quality being noted in the factory journal. Before churning the cream, fluid annato is added,—that from Messrs. N. N. Blumensaat, in Odense, Denmark, has been found the best,—in quantities suitable to the different seasons, giving the butter the colour which is required for different markets.

The assorted lumps of butter are separately and carefully worked together, during which operation a certain quantity of salt, varying from two to five per cent. is added. The salt used is refined in Sweden. and is as pure and dry as possible; one-quarter to one-half per cent. of sugar is also added. When the butter is ready, it ought to possess a waxy firmness, perfectly uniform in appearance. It is then packed in casks of beechwood, previously well saturated with brine, and containing from 60 pounds to 100 pounds of butter each. Before closing the casks, the name of the dairy where the butter has been manufactured is pressed in the butter, and finally the butter is covered by a piece of gauze, and thereupon a little salt. The mark of the company and the net weight, in English pounds, are painted on the cover, if the butter is of the first quality. The casks containing second class butter are only marked with the initials of the dairy; and third class butter is sold on the spot, or returned to the respective deliverers of the cream. The butter is sent at least once a week to the market it is intended for.

During last summer butter was placed for some time in a dry and cool cellar, to ascertain how long it would keep, and after two months it brought the same price in London as fresh butter sent at the same time.

For the Russian market, as well as for some home demand, what is called Parisian butter has been manufactured. Perfectly sweet cream, which is heated to from 80° to 90° Cent. (176° to 194° Fahr.), and then permitted to cool again to the usual temperature before being churned, is used for this kind of butter, which is otherwise made in the usual manner, but without add-

ing annato or salt. By the heating of the cream the butter obtains a slight almond-taste, and seems also to keep longer.

The cream is paid for according to the weight of butter it yields after the first working, and before the lumps are mixed together and salted, after a deduction of three per cent. for the loss caused by the final process and the adding of the salt; but the experience gained last year proved that this loss did not exceed two per cent.

There is still a large field for similar operations in our extensive country, and the immense increase in the productions of the dairy farms. The consequence of the development of this hitherto neglected branch of husbandry, is at the same time the foundation of the future advancement of our agriculture.

A DAY AT TIPTREE HALL.

The invitation which Mr. Mechi so liberally gave to all who were interested in agriculture has been as generously taken advantage of. From all quarters of the country those engaged in the cultivation of the soil came to visit Tiptree Hall. We are well aware that Mr. Mechi's theories have not been approved of by all men; we know that even in his own immediate neighbourhood they have been looked upon with callousness. But it came to our knowledge long ago that Mr. Mechi was appreciated by such enterprizing agriculturists as Mr. Sadler, who, unaided, was the first tenant-farmer to introduce Fowler's steam-plough into Scotland, and whose example was followed shortly after by some of the most eminent farmers in the Lothians, who chose different systems of disintegrating the soil by the motive power of steam. We need only mention the names of Mr. George Hope, of Fentonbarns—whose dissociation from the farm upon which he was brought up has excited so much discussion, some of it quite uncalled for, who fancied Howard's "Round-about," as it was called, and which worked well; Mr. Begbie, who bought Fowler's; and Mr. Reid. Drem (whose father, if we forget not, was the first to introduce a steam thrashing-mill into Scotland). who preferred the "come-and-go system" of Coleman. Lord Kinnaird also was not too proud to take a leaf out of Mr. Mechi's book, and to declare that he profited by the lesson therein taught. All these gentlemen admired Mr. Mechi for his determination, at whatever cost, to increase the fertility of the ground by deeper cultivation, and by more liberal treatment in the matter of manures. Mr. Mechi's balance-sheets, as a rule, have shewn that his theories were profitable in practice. Some people have cavilled at the figures, but none have proved that they were wrong. And of one thing we are certainly assured, that Mr. Mechi's name in future times will be regarded as that of one who assisted very materially in making British agriculture what it was in the latter half of the nineteenth century.

Mr. Mechi has arrived at an age at which most men would be inclined to lie idly upon their oars He has won laurels, it might be supposed, sufficient to decorate his brows. Have not his books and articles been quoted in newspapers all over the world, and his ideas permeated those who have a relish for agriculture from John O'Groat's to Wagga-Wagga. "Still he is not happy," because in his own country he has not yet been able to succeed in impressing upon his fellow-labourers in the great field of meat production the absolute necessity of thorough drainage, of deep cultivation, and of liberal treatment of the land with manurial substances, particularly with those kinds which are made upon the land by cattle under cover.

It was a treat to go over the farm and hear what we may well call "the old man eloquent" expatiate upon the conditions under which he contrived to make a barren waste to "bloom and blossom as the rose." No merely figurative words are being used when we say this—they are sober truth, as a portion of the unreclaimed common at the other side of the hedges of one or two of the fields will shew. From a swamp, over which snipe were wont to flutter and be brought down by the gun of the now owner some thirty years ago, an ornamental water has been formed, upon which a pleasure-boat can be rowed, where pike and roach and tench breed, and trout might have been kept but for that "fresh-water shark," with the long nose, mentioned first. The draining of this bog relieved the adjoining farmers of their surplus water; it enabled Mr. Mechi, while doing a good turn for himself, to confer benefits upon others. Those who had too much water upon farms above him got rid of it; those who had too little in farms lying below Tiptree Hall have gratefully expressed their thanks for the surplus water his capital, intelligently applied, distributed to them in dry seasons. Tiptree Hall, where only a third of a century ago furze and heather and weeds grew in no stinted way, is now surrounded by fine trees and shrubs of marvellous growth. It is as sheltered a nook as the most retired country gentleman could desire to occupy, and yet these umbrageous stems have been planted since the time the owner attained middle age. This shews what energy, along with money, can accomplish in a short space of time. Mr. Mechi attributes this speedy development to deep cultivation, and to the manner in which he applied the manure to the roots of the trees. He shews, with justifiable pride, in his green house, a camellia of beautiful growth, whose bearing powers are as great as its dimensions, and he ascribes the merits of the plant entirely to the fact that he had taken care to see that the liquid manure applied had penetrated to the roots. Surface applications are not, in Mr. Mechi's opinion, of any account. The expense of such applications are great, but the returns altogether unsatisfactory. More than eighteen centuries ago a notion similar to that which Mr. Mechi now holds was expressed. The roots of the tree must be cared for if the branches are to flourish.

To come more particularly to the farm, we must say that the cropping is as judiciously distributed and grown, as skill combined with capital can make it. With that penetration, which has all along distinguished Mr. Mechi in his agricultural operations, he resolved to effectually drain the land he had acquired; and it was his wish that the farm should, if possible, possess the material advantage of a constant and unfailing supply of water. The system of irrigation, introduced into Tiptree, is very effective. Numerous hydrants are distributed over the farm, each of which irrigates eleven acres, and with a success that was the reward only of unceasing and expensive perseverance, Mr. Mechi has managed to extract from a cold marsh a stream of translucent water, which at present gives him a supply of no less than twenty-five gallons per minute. The field upon which this exceptional and valuable adjunct to the farm was discovered, was formerly bog land composed of twenty varieties of soil; at the present time it is bearing a very good crop of wheat. Mr. Mechi states, that his mode of cropping is invariably to take barley after wheat. Last year, the average yield of barley was about six quarters per acre, and of wheat the product—in the previous year, a bad one—averaged five quarters per acre. The sheep are ultimately folded, after the wheat stubble, with Indian corn and cake, but if this is not done, home-made manure is put upon the land. Instead of taking barley after wheat on the clover ley, red wheat

is taken after white wheat, because, as Mr. Mechi rightly surmises, "it would not do to take the same sort of wheat twice." In exceptionally favoured years the yield per acre amounts to as much as seven and eight quarters—a clear proof. Mr. Mechi thinks, of the advantages of thin sowing and liberality in the use of manurial substances. Rye-grass is then sown in the barley, and after two years gives way to peas, which are sown very early in the spring. Peas are followed, in the same year, by the ordinary white turnip, fed off with sheep on corn and cake. In December wheat is again sown. Once in eight years Mr. Mechi takes red clover. In order to save as much time as possible—and it can easily be imagined that a fortnight will be of infinite value to the owner of Tiptree—the haulms of the peas are taken off the land to the cattle-yards. While the land is being cleaned, therefore, the pea haulms thus undergo a process of hardening in the yards which enhances their value, and enables the land to be cleaned for the next crop. This year the crop of blue peas has realized Mr. Mechi £26 an acre net, the haulms going back to the land.

As regards manures. Mr. Mechi mixes from two to four bushels of salt with guano; he refrains from using phosphates extensively, because there is, he thinks. a good deal of that element in the soil itself. He is very careful in the use of superphosphates, as he believes that where indiscriminately used they are seldom very effectual. It must be borne in mind by all that the land is not manured either for turnips, peas or wheat. The former are, of course, folded off, and the land is thoroughly manured for the following crop. For the barley, however, guano mixed with salt is applied to the soil. Six pecks of seed per imperial acre is the maximum amount of seed sown for barley, Mr. Mechi putting it down as an axiom that the "higher the farming the less seed need be put in." The splendid crop of wheat to be seen at present waving on the fields was sown on the 21st of January. five pecks of seed per acre being used. We should advise any one who have any doubts respecting the thin sowing theory to "go and see for themselves." The thing has been tested experimentally at Kelvedon, and the practice bears wonderfully good results. All the wheat is drilled in rows nine inches apart, and the opportunity of horse-hoeing is never missed. Mr Mechi says that he has horse-hoed no less than twenty-two acres in one day with a couple of horses, but the average amount of work accomplished is about a dozen acres per day.

Subsoiling has been one of the great advantages which Mr. Mechi contends, Tiptree received. Most farmers believe it impossible to extract any valuable ingredients from the under soil of a plastic clay such as Mr. Mechi's is; but they would, we imagine, be forced to admit that the subsoiler has effected an incalculable benefit to the poor land constituting this wonderful farm. The pan, Mr. Mechi said, was hard and bare: "I broke up the gravel stuff and the hard pan, and the consequence was that things don't dry up and burn as they used to do. With drainage," the hospitable Tiptree farmer added, "the basis of my success has been the depth of cultivation." The subsoil plough in use is simply an ordinary iron implement without the mould-board. The land is first ploughed with two horses, and two and sometimes four animals following in the track of the first plough, draw the subsoiler.

As for the stock, Mr. Mechi always breeds his own lambs. He is peculiarly fortunate with his youngsters, losing on the average only two each year. The only one that was lost this season died the other day from the effects of sunstroke. Hampshire Down rams are used with Lincoln or Cotswold ewes—colour being an essential in the face—and the produce of the present year are a splendid lot. The animals are not allowed to roam over the pasture. Thirty years ago Mr. Mechi expended a considerable sum of money upon hurdles mounted upon wheels for the purpose of confining the sheep. These hurdles are excellently adapted to this purpose. The sheep are never more than twelve hours within the same space, during which time additional food to the nourishing bite received from the herbage, is brought to them. This year they sold for 68*s*., a considerable increase upon the average of former seasons. Mr. Mechi states that he works all the ewes until they are completely worn out, a regular number being drafted each year from the pastures into the courts, where they get "as fat as hogs." The total area of grass and root crops consumed on the farm is thirty acres annually, and upon that limited area Mr. Mechi manages to produce meat to the value of £100. The bullocks are kept in an extensive range of courts, provided with the most approved arrangements as to feeding, etc. All the fodder prepared for the stock and horses is put through the chaff-cutter, and all the root food prepared is pulped and mixed therewith. Pulping and chaff-cutting, Mr. Mechi maintains, are the true principles of profit in the feeding of stock.

The root crops at Tiptree are unsurpassed by any in the south of England. The kohl rabi bears a particularly promising appearance, and the mangold—manured with fish—looks as if a splendid crop will be reaped. The cabbages also are wonderfully well developed for the season, and very vigorous and healthy.

Mr. Mechi allows his poultry to have free access to a field of corn adjoining his steading, and believes in the views that we have always maintained in *The Farmer*, that if properly managed, poultry could be made a very profitable source of the farmer's income.—*Farmer, July* 28, 1873.

GRIPES OR COLIC IN HORSES.

These terms are applied to a set of symptoms in the horse denoting abdominal pain, and may be due to more than one condition of the digestive organs. When a horse paws the ground, looks round at his flank, lies down and quickly rises again, or it may be rolls about, it is said, he is griped. These symptoms only indicate abdominal pain, but as this, in over 90 per cent. of cases, depends upon constipation with spasms of the intestines, we may allow the term a definite meaning. Though probably the most common affection of the horse, we believe it is the one in which the greatest mistakes in treatment are seen. The usual course of reasoning seems to be—Here is spasm of the bowels: give sedatives and we shall allay the spasm. In the human subject this common practice is very successful—brandy and laudanum are well-known agents for the cure of "gripes." In the horse, however, we hardly ever meet gripes in conjunction with diarrhœa; on the contrary, constipation is present. The order of production seems to be bad food or bad feeding—indigestion and constipation; these irritate the bowels and produce spasm. Sedatives can only increase the constipation, and thus add to the danger of the attack, whereas the rational treatment seems to be to remove the cause at once by aperient medicine. This treatment has stood the test of experience, and we can promise that no case of gripes will end fatally if treated at the commencement with a dose of physic.

As prevention is better than cure, we had better, perhaps, consider a little more fully the cause of gripes. Two things are required for good digestion—healthy digestive organs and proper food. First, as to food. Wheat, potatoes, bean straw, wet grass, and the sweepings of the harvest fields are the most common kinds of food to the consumption of which gripes are traceable. These substances are all indigestible and dangerous provender for even healthy horses, and should be

avoided. Even good food improperly used may cause gripes. A heavy feed after long abstinence is a common cause.

But as quietness is favourable to digestion, so excitement is unfavourable. Some horses put to fast work on a full stomach scour, and have diarrhœa The indigestible food irritates the intestines, and is thrown off. More commonly, however, undigested food is retained in the large intestines, and constipation induced. Add to this a draught of cold water or a chilled skin, and gripes ensue. Cold water never produced gripes in a horse; it is only an exciting cause, when the predisposing cause, indigestion, previously exists. When horses are overworked, not only the muscles of the body become weak, but the muscular tissue of the stomach and intestines loses its tone, and these organs are incapable of properly performing their functions. Under these conditions even good food is undigested, and a predisposing cause of gripes exists.

It is not correct to say that gripes runs on to inflammation of the bowels. This event may arise from the abuse of such drugs as turpentine. or it may arise as a primary disease; but gripes, properly treated, does not run on to inflammation. In inflammation of the bowels the contents of the intestines are always fluid, in gripes never. Inflammation is accompanied by constant pain, gripes by periods of violent pain with alternate periods of rest. The pulse in gripes seldom exceeds 50 pulsations per minute, in inflammation it is seldom less than 70 per minute. Injections, which are useful in both diseases, offer a valuable distinctive symptom. In simple colic they are retained for some minutes, in inflammation the gut at once rejects them.

Assuming, then, that our view of the pathology of gripes is correct, treatment should be mainly directed to relieving the bowels of the irritating undigested matter. In many cases nature would, in a little time, do this herself, and it is in these cases that success follows the use of stimulants only, as ale and ginger, brandy and allspice, etc. When it is of some importance not to have a horse off work for a day, we may try the effect first of some stimulant mixture, as—Tincture of allspice, 1 oz.; sulphuric ether, 1 oz. If, however, this does not allay the pain in less than half-an-hour, give a full dose of physic—aloes is best. Whatever drugs are used, injections of warm water should be employed every hour or two. They should not contain soap or salt, or any irritant; they act best when longest retained.

Avoid turpentine; it is dangerous, and possesses no virtues over ether. Oil is good in a mild case, but hardly active enough when much constipation exists. All food should be denied for at least twelve hours, and oatmeal gruel is the most easily digested material to commence with. Never allow an animal with gripes to roll on his back or to be trotted about. Above all, lose no time in attending to the first symptoms.—*Land and Water.*

STORING EGGS.

For storing eggs a very good plan is to have a large board pierced with holes in regular rows. Many breeders keep them in bran; and this latter method is, perhaps, best for those meant only to be eaten; but for setting hens the pierced board has many obvious conveniences. They should be always kept with the large end downwards. This direction being exactly contrary to that usually given, we should state that our attention was first called specially to the subject by a most intelligent lady, who advocated this plan, alleging as the probable reason of its superiority: "Keeping eggs on the small end appears to me to cause the air-bubble to spread, detaching it from the shell, or rather from its membranous lining; and after being so kept for a fortnight the air-bubble will be found to be much spread, and the eggs to have lost much vitality, though still very good for eating." She then described her success the other way, adding: "Owing to this method of storing, such a thing as a stale egg has never been known in my house; and as regards success in hatching, for several seasons, when I was able to attend to my poultry myself, of many broods set every egg produced a chick." We were by no means hasty in adopting or recommending this plan, but after careful observation and comparison for two seasons, have proved indisputably that both for eating and setting, eggs do keep much better the large end down. There is, after a week, a marked difference in eggs kept in the two positions as regards the spreading of the air-bubble—which is well known to affect both the freshness for eating and vitality for setting of stored eggs—and after three weeks the difference can be discerned even by the taste alone. It will, of course, matter little which mode is adopted, provided the eggs are used for either purpose within a short time; but the longer kept, the more the difference from the two positions increases, and while eggs stored with the small end down cannot be depended upon after a fortnight to produce more than a proportion of chickens, those kept in the way we now advocate will keep perfectly good for hatching a month, or even more. We have sent thirty dark Brahma eggs to Ohio, U. S., which were twenty-two days on the road; yet they produced eighteen strong, lively chickens, or sixty per cent., though the eggs must have been nearly a month old. We ought, however, to add that, as already observed, we based our change of plan not on any single instance, however striking, but on systematic trial for two seasons. During each of these seasons we sent out about forty sittings (of ten each) dark Brahma eggs, and we satisfied ourselves most fully that, with the ordinary age of eggs thus sold by English fanciers—say from three to thirteen days—the difference in favour of eggs stored the large end down amounted to nearly five per cent. This may not be much; but, as already remarked, with age it increases, and we have proved as conclusively, by actual trial, that eggs may be set and successfully hatched, with remarkable uniformity, at ages which, kept in the usual method, would be nearly hopeless. We have known eggs kept a month hatch fairly, even on the old system; but we are now speaking of usual and average results, and simply place at the service of fanciers in general the results of patient trial, which have abundantly satisfied ourselves that there is a real difference in the product of the two positions. With regard to packing, so far as actual injury is concerned, we believe there is no difference whatever in the two ways; but if the journey occupy any time, the same position should be maintained for similar reasons.—*Farmer, July* 28.

JUDGING AND BEING JUDGED.

Mr. Beale Browne's name is one well known throughout Great Britain and Ireland, in connexion with Cotswold sheep. The merits of his flock have been spread abroad by all reporters, at national and local shows. No breeder, so far as we can remember, ever objected *in print* to Mr. Beale Browne attaining the position assigned to him by the judges, although sometimes they may have thought that more honour than was due to him was accorded. We certainly never heard Mr. Beale Browne say that he was farther forward than he ought to have been, nor throw insinuations out as to the capacity of the arbiters. When he was first he never for a moment thought that he did not get his proper desert; under such circumstances, therefore, we are of opinion that it would have been better if Mr. Beale Browne had abstained from pub-

lishing such criticism on the Hull Show as the following:

"Every allowance should be made for judges, but when prizes are awarded, as in some of the Cotswold classes, it is too glaring to prevent universal condemnation. So disgusted was I that I shall never shew again after this year. I have subscribed and shewn at more agricultural societies than any other man in England. I have never interfered in any way with their management, but I have ever begged them not to appoint local or interested persons to act as judges. No one objected to Mr. Browne, of Marham, having prizes with his old sheep; they were large, and very fat. His first prize shearling was the best sheep I ever saw shewn, and the other two were good sheep, though I was astonished when the noblemen and gentlemen who bought mine, and measured them with his second and third prize sheep, to find they were as large in girth, though not so old or so fat. The first prize shearling ewes were the worst I ever saw have a prize Their heads matched, but not their carcases, and they had no quality, and, as several said, no hind quarters. The second prize sheep were better, but deficient in quality and necks."

We remember having been at a show in the north country when the judges differed about the merits of some fat cattle, the end being that the prize went to a polled, instead of to one or other of the crosses which were contending against it. This decision occasioned great dissatisfaction to the writer as well as to those who were interested. An eminent breeder attempted to throw oil upon the troubled waters. He publicly expressed his opinion that it was too bad to blame the judges, who were "all honourable men," and men well acquainted with stock—that the decisions of judges should not be cavilled at. This same eminent breeder, who bowed down so meekly to the fiat of the fat-stock judges, was an exhibitor in another class. The writer was requested to have a look at the stock exposed in this breeder's name. He saw them and made no remarks. The exhibitor did. He asked if it were not a shame that he should have only second place, when, in his own opinion, he was clearly entitled to the first. What could be said. in reply? This, and this only, after the previous observations of the gentleman about the immaculate and skilful character of judges generally, that it was out of place for him to quarrel with the affixing of the cards.

Will Mr. Beale Browne accept the moral? Will he allow younger breeders to gain prizes without accusing the men appointed by the Society of the Royal to give the awards, after due consideration no doubt, of having acted towards him unfaithfully? He may have got to the top of the ladder in this breed of sheep, but having attained the utmost round he need not scorn the "base degrees from which he did ascend." Second thoughts, it is said, are best; and if Mr. Browne reconsiders his observation that he "shall never shew again after this year," we think that in the interest of agriculturists, if not for himself, his name will again appear in the catalogue of the Royal Agricultural Society of England.—*Farmer, Lond. and Edin., Aug.* 4, 1873.

TOP-DRESSINGS AND SALT

BY J. J. MECHI.

Great mistakes are sometimes made by the use of nitrate of soda alone on poor lands as a top-dressing. It contains very few elements of manure, therefore the intensely green and improved colour of the crop is delusive, which I have observed, and this is also the opinion of Baron Liebig (see his "Modern Agriculture," letter 4, p. 53). I much prefer and always use the best Peruvian guano, mixed well with its own weight of common salt, for in this mixture you have nearly all the elements of plants, excepting potash and silica. A comparative trial in the same field will give satisfactory evidence when the crop is harvested. With nitrate of soda the growth of straw is forced, and it is often mildewed. There are cases where nitrate of soda is advantageous, such as on soils abounding in phosphate of lime and other fertile elements.

Common salt I have used much the last twenty-five years, and am convinced of its advantages on drained and well-farmed land, especially on light land; for where salt is used the moisture of the air will be more abundantly appropriated and retained. About five o'clock one fine summer's morning, I noticed that where the salt had been sown the previous day, every grain of salt had attracted to itself the dew, and formed on the surface of the ground a wet spot about the size of a sixpence, the ground being generally very dry. On our light lands it consolidates them, and makes them especially firm and acceptable to the wheat plant, whose straw will stand firm and erect, although 4½ to 5 feet long. It is also unfavourable to certain weeds by this consideration. It prevents the ravages of wire-worm. It is especially favourable to saline plants, such as mangold, whose ashes contain fifty per cent. of salt. I never sow guano, except mixed with its own weight of salt. Like everything else, it has, I am sorry to say, greatly risen in price. I observe that all crops seems to thrive well on land near salt water, especially where the land is drained. Lumps of rock salt should always be placed in mangers for horses or cattle; their instinct teaches them when to avail of it. The spring consolidation of light land, where wheat is sown, by salting and heavy Crosskilling, greatly benefits the crop; very light hand-hoeing should follow these operations, although frequent hoeing is scarcely required. Liebig, in his "Natural Laws of Husbandry," cap. xii, p. 335, correctly describes nitrate of soda and common salt as "chemical means for preparing the soil." Referring to the experiments, he says (p. 337): "In both these series of experiments, the crops of corn and straw were remarkably increased by the addition of common salt; and it is scarcely necessary to repeat that such an augmentation could not possibly have taken place unless the soil had contained a certain quantity of phosphoric acid, silicic acid, potash, etc., capable of being brought into operation, but which, without common salt, was not assimilable." Liebig also says (p. 340): "The grass of a meadow which has been manured with common salt, is eaten by cattle with greater relish, and preferred to any other; so that even from this point of view common salt deserves attention as a manure."

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THE JOURNAL

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The Office of the Society is in the Agricultural Hall, corner of State and Lodge streets, Albany; and all communications on business of the Society should be so addressed.

ANNUAL MEETING.

Pursuant to amendment of the Constitution adopted at the Annual Meeting of 1872, the Annual Meeting will hereafter be held on the Wednesday succeeding the third Tuesday of January in each year, at the city of Albany.

Annual Meeting of 1874, January 21st.

New-York State Agricultural Society.

AWARDS

AT THE

THIRTY-THIRD ANNUAL EXHIBITION

OF THE

NEW YORK STATE AGRICULTURAL SOCIETY,

Held at Albany, September 24 to October 1, 1873.

CLASS I.—CATTLE.

No. 1. SHORT HORNS.

SHORT HORN HERD PRIZE.

Charles F. Wadsworth, Geneseo, N. Y., Large Gold Medal.

Bull, Baron Bates, 3rd;

Roan, calved February 27, 1871, bred by Walcott & Campbell, New York Mills, N. Y.; sire 4th Duke of Geneva 7931, dam Lady Bates by Duke of Airdrie (12730), gr. d. Lady Bell 3rd by El Hakim 2814.

Cow, Amena;

Red, calved January 22, 1868, bred by Craig W. Wadsworth, Geneseo, N. Y.; sire Reynolds 6115, dam Agnes by Macaroni 5919, gr. d. Alice by Howard 2983.

Cow, America;

Roan, calved February 18, 1868, bred by Craig W. Wadsworth, Geneseo, N. Y.; sire Reynolds 6115, dam Amazon by Major 5922, gr. d. Agnes by Macaroni 5919.

Cow, Artless;

Red, calved May 6, 1870, bred by James W. Wadsworth, Geneseo, N. Y.; sire Duke of Houston 9870, dam Atlantic by Reynolds 6115, gr. d. Alice by Howard 2983.

Heifer, Alberta;

Red roan, calved January 10, 1872, bred by exhibitor; sire Millbrook 8629, dam America by Reynolds 6115, gr. d. Amazon by Major 5922.

Heifer, Australia 4th.

Red and white, calved October 30, 1872, bred by exhibitor; sire Millbrook 8629, dam Amena by Reynolds 6115, gr. d. Agnes by Macaroni 5919.

Bulls over Three Years Old.

First prize, B. F. Denison, Geneseo, N. Y.; Attica, red and white, calved May 18, 1870, bred by Craig W. Wadsworth, Geneseo, N. Y.; sire Duke Imperial 5526, dam Alice by Howard 2983, gr. d. Australia by Lord Foppington (10437) $50

Second, F. Wood Gray, Quebec, Canada; Knight of St. Michael's, white, calved December 4, 1868, bred by exhibitor; sire 3rd Duke of Claro (23729), dam Princess by 7th Duke of York (17754), gr. d. Forest Queen by Fitz-Roy (16058) 30

Third, E. Townsend, Pavilion Centre, N. Y.; King Arthur, red and white, calved May 3, 1870, bred by Stephen Wade, Yarmouth, Ont.; sire Canadian Chief [1062], dam Fanny by Sir Charles 5180, gr. d. Daisy by Clyde 3762 10

Bulls Two Years Old.

First prize, Charles F. Wadsworth, Geneseo, N. Y.; Baron Bates 3rd, roan, calved February 27, 1871, bred by Walcott & Campbell, New York Mills, N. Y.; sire 4th Duke of Geneva 7931, dam Lady Bates by Duke of Airdrie (12730), gr. d. Lady Bell 3rd by El Hakim 2814 40

Second, Charles F. Wadsworth, Geneseo, N. Y.; Prince of the River, red, calved August 13, 1871, bred by E. A. Phelps, Avon, Conn.; sire Grand Duke 8247, dam Rosaline by Berkshire Duke 2539, gr. d. Tuberose 5th by Tornado 1040 25

Third, W. F. Blanchard, Manlius, N. Y.; Dean, red, calved May 5, 1871, bred by exhibitor; sire Treble Gloster 7331, dam Dawn by Oscar 6016, gr. d. Bloom 4th by Nestor 5035 10

Bulls One Year Old.

First prize, Thomas L. Harison, Morley, N. Y.; 4th Baron Morley, roan, calved April 30, 1872, bred by exhibitor; sire Saladin 10938, dam Rose Ann by Conrad 5478, gr. d. Rosette by Oxford Lad (24713) 30

Second, Charles F. Wadsworth, Geneseo, N. Y.; Alexander, red and white, calved November 26, 1871, bred by exhibitor; sire Millbrook 8629, dam Amena by Reynolds 6115, gr. d. Agnes by Macaroni 5919 20

Third, Ezra J. Clark, Bellville, N. Y.; Eureka 2nd, roan, calved October 31, 1871, bred by exhibitor; sire Eureka 8110, dam Ophelia by Treble Gloster 7331, gr. d. Orphan by Apricot's Gloster 2500 10

Bull Calves.

First prize, Charles F. Wadsworth, Geneseo, N. Y.; Prince of the Valley, roan, calved April 30, 1873, bred by exhibitor; sire Baron Bates 3rd 11332, dam Oxford Rose by Prince of Oxford 3308, gr. d. Rosalie by Red Rover 2109 20

Second, Frank B. Redfield, Batavia, N. Y.; Roderick, red and white, calved January 17, 1873, bred by S. B. Lusk, Batavia, N. Y.; sire Roderick Dhu 12810, dam Zorayda by Rosecrans 6140, gr. d. Kitty by Commodore 3778 .... $10

Cows over Three Years Old.

First prize, Charles F. Wadsworth, Geneseo, N. Y.; Amena, red, calved January 22, 1868, bred by Craig W. Wadsworth, Geneseo, N. Y.; sire Reynolds 6115, dam Agnes by Macaroni 5919, gr. d. Alice by Howard 2983 50

Second, Charles F. Wadsworth, Geneseo, N. Y.; Artless, red, calved May 6, 1870, bred by James W. Wadsworth, Geneseo, N. Y.; sire Duke of Houston 9870, dam Atlantic by Reynolds 6115, gr. d. Alice by Howard 2983 30

Third, Charles F. Wadsworth, Geneseo, N. Y.; America, roan, calved February 18, 1868, bred by Craig W. Wadsworth, Geneseo, N. Y.; sire Reynolds 6115, dam Amazon by Major 5922, gr. d. Agnes by Macaroni 5919 10

Heifers Two Years Old.

First prize, W. F. Blanchard, Manlius, N. Y.; Rural Belle, red, calved March 10, 1871, bred by exhibitor; sire Treble Gloster 7331, dam Bloom 5th by Apricot's Gloster 2500, gr. d. Bloom 4th by Nestor 5035 40

Second, John R. Stuyvesant, Poughkeepsie, N. Y.; Patty, red, calved March 18, 1871, bred by George V. Hoyle, Champlain, N. Y.; sire Malcolm 8578, dam Pamela by Agate's Airdrie 5304, gr. d. Phœbe by Berlin Hero 257 25

Third, David K. Bell, West Brighton, N. Y.; Lilly May, roan, calved March 6, 1871, bred by exhibitor; sire Marmaduke, Jr., 12399, dam Nina by Governor (12957), gr. d. Nightingale by Whitaker's Comet (8771). 10

Heifers One Year Old.

First prize, Charles F. Wadsworth, Geneseo, N. Y.; Rosebud, red, calved December 3, 1871, bred by exhibitor; sire Prince of Oxford 4th 10684, dam Bellflower 8th by Prince of Oxford 3rd 6063, gr. d. Bellflower 7th by Berkshire Duke 2539 30

Second, Charles F. Wadsworth, Geneseo, N. Y.; Alberta, red roan, calved January 10, 1872, bred by exhibitor; sire Millbrook 8629, dam America by Reynolds 6115, gr. d. Amazon by Major 5922 20

Third, William F. Blanchard, Manlius, N. Y.; Memento, red, calved June 7, 1872, bred by exhibitor; sire Royal Bridegroom 12846, dam Bloom 5th by Apricot's Gloster 2500, gr. d. Bloom 4th by Nestor 5035 10

Heifer Calves.

First prize, Charles F. Wadsworth, Geneseo, N. Y.; Rosebud 2nd, red, calved January 9, 1873, bred by exhibitor; sire Millbrook 8629, dam Bellflower 6th by Widcawake 4482, gr. d. Bellflower 4th by Red Rover 2109 20

Second, Charles F. Wadsworth, Geneseo, N. Y.; Australia 4th, red and white, calved October 30, 1872, bred by exhibitor; sire Millbrook 8629, dam Amena by Reynolds 6115, gr. d. Agnes by Macaroni 5919................ $10

BENJAMIN SUMNER, *Woodstock, Conn.*
H. C. HOFFMAN, *Horseheads, N. Y.*

No. 2. DEVONS.

DEVON HERD PRIZE.

William Mattoon, Springfield, Mass., Large Gold Medal.

Bull, Lion;

Calved July 2, 1863, bred by B. F. Andrews, Waterbury, Conn.; sire Brandywine 17, dam Gipsy 3rd by Reuben 106, gr. d. Gipsy Maid by Baron.

Cow, Rose 5th;

Calved March 3, 1862, bred by Dayton Mattoon, Watertown, Conn.; sire Nelson 75, dam Rose 2nd by Albert Jr., gr. d. Rose by Baltimore 364, H.

Cow, Isabella;

Calved March 10, 1867, bred by exhibitor; sire Major 275, dam Rose 4th by Nelson 75, gr. d. Rose 2nd by Albert Jr.

Cow, Rose 7th;

Calved February 7, 1869, bred by exhibitor; sire Major 275, dam Rose 2nd by Albert Jr., gr. d. Rose by Baltimore 364, H.

Cow, Rose 8th;

Calved May 12, 1870, bred by exhibitor; sire Highland 244, dam Rose 4th by Nelson 75, gr. d. Rose 2nd by Albert Jr.

Heifer, Rose 10th;

Calved March 15, 1871, bred by exhibitor; sire Highland 244, dam Rose 2nd by Albert Jr, gr. d. Rose by Baltimore 364, H.

BULLS OVER THREE YEARS OLD.

First prize, William Mattoon, Springfield, Mass.; Lion, calved July 2, 1863, bred by B. F. Andrews, Waterbury, Conn.; sire Brandywine 17, dam Gipsy 3rd by Reuben 106, gr. d. Gipsy Maid by Baron................ $30

Second, Joseph Hilton, New Scotland, N Y.; Prince of Wales, calved August, 31 1864, bred by H. M. the Queen of England; sire Prince Alfred (709), dam Peony by Saracen (520a), gr. d. Crocus by Baronet (6). 20

BULLS TWO YEARS OLD.

First prize, J. Carter Brown 2nd, East Greenwich, R. I.; Duke of Flitton 9th, calved July 9, 1871, bred by James Davy, North Molton, Devon, Eng.; sire Duke of Flitton 4th (827), dam Cherry 3rd by Duke of Flitton 2nd (825), gr. d. Cherry by Davy's Napoleon 3rd (464) 30

Second, Joseph Hilton, New Scotland, N. Y.; Prince of Wales 9th, calved February 10, 1871, bred by exhibitor; sire Prince of Wales, dam Edith 2nd by Sachem (517), gr. d. Edith, imported by Lewis G. Morris, Fordham, N. Y........................ $20

Third, William Mattoon, Springfield, Mass.; Duke of Hampden, calved July 6, 1871, bred by exhibitor; sire Highland 244, dam Rose 5th by Nelson 75, gr. d. Rose 2nd by Albert Jr.................................. 10

BULLS ONE YEAR OLD.

First prize, Joseph Hilton, New Scotland, N. Y.; Prince of Wales 11th, calved January 1, 1872, bred by exhibitor; sire Prince of Wales, dam Ida by Empire 424 H, gr. d. Edith imported by Lewis G. Morris, Fordham, N. Y.............................. 25

Second, William Mattoon, Springfield, Mass.; Duke of Exeter, calved June 20, 1872, bred by exhibitor; sire Springfield 342, dam Rose 3rd by Orphan Boy 83, gr. d. Rose 2nd by Albert Jr........................ 15

BULL CALVES.

First prize, Joseph Hilton, New Scotland, N.Y.; Prince of Wales 12th, calved February 10, 1873, bred by exhibitor; sire Prince of Wales, dam Belle 4th by Prince of Wales, gr. d. Belle 2nd by Sachem (517)........ 20

Second, J. Carter Brown 2nd, East Greenwich, R. I.; Artist, calved April 19, 1873, bred by exhibitor; sire Duke of Flitton 9th (imp.), dam Picture by Duke of Edinburgh (823), gr. d. Picture 6th by Prince Alfred (491)......................... 10

COWS OVER THREE YEARS OLD.

First prize, William Mattoon, Springfield, Mass.; Isabella, calved March 10, 1867, bred by exhibitor; sire Major 275, dam Rose 4th by Nelson 75, gr. d. Rose 2nd by Albert Jr.................................. 30

Second, J. Carter Brown 2nd, East Greenwich, R. I.; Cowslip, calved January, 1869, bred by Walter Farthing, Stowey Court, Eng.; sire Master Alic (881), dam Curly by Leopold (447), gr. d. Cherry by Wonder (345) 20

Third, Joseph Hilton, New Scotland, N. Y.; Belle 4th, calved April 10, 1869, bred by exhibitor; sire Prince of Wales, dam Belle 2nd by Sachem (517), gr. d. Belle by Albert 2........................... 10

HEIFERS TWO YEARS OLD.

First prize, Joseph Hilton, New Scotland, N.Y.; Kitty, calved March 20, 1871, bred by exhibitor; sire Prince of Wales, dam Ida by Empire 424 H, gr. d. Edith, imported by Lewis G. Morris, Fordham, N. Y............ 30

Second, William Mattoon, Springfield, Mass.; Rose 10th, calved March 15, 1871, bred by exhibitor; sire Highland 244, dam Rose 2nd by Albert Jr., gr. d. Rose by Baltimore 364h 20

Third, Joseph Hilton, New Scotland, N. Y.; Jenny, calved April 30, 1871, bred by exhibitor; sire Prince of Wales, dam Edith 3rd by Sachem (517), gr. d. Edith, imported by Lewis G. Morris, Fordham, N. Y..... $10

HEIFERS ONE YEAR OLD.

First prize, Joseph Hilton, New Scotland, N.Y.; Belle 5th, calved November 2, 1871, bred by exhibitor; sire Prince of Wales, dam Belle 4th by Prince of Wales, gr. d. Belle 2nd by Sachem (517).................. 25

Second, William Mattoon, Springfield, Mass.; Rose 12th, calved February 16, 1872, bred by exhibitor; sire Springfield 342, dam Rose 2nd by Albert Jr., gr. d. Rose by Baltimore 364 H 15

Third, Joseph Hilton, New Scotland, N. Y.; Edith 5th, calved December 30, 1871, bred by exhibitor; sire Prince of Wales, dam Edith 2nd by Sachem (517), gr. d. Edith, imported by Lewis G. Morris, Fordham, N. Y.............................. 10

HEIFER CALVES.

First prize, Joseph Hilton, New Scotland, N. Y.; Edith 6th, calved November 25, 1872, bred by exhibitor; sire Prince of Wales, dam Edith 3rd by Sachem (517), gr. d. Edith imported by Lewis G. Morris, Fordham, N. Y.............................. 20

Second, Joseph Hilton, New Scotland, N. Y.; Emma, calved October 31, 1872, bred by exhibitor; sire Prince of Wales, dam Ida by Empire 424 H, gr. d. Edith, imported by Lewis G. Morris, Fordham, N. Y......... 10

E. H. HYDE, *Stafford, Conn.*
B. H. ANDREWS, *Waterbury, Conn.*

NO. 3. HEREFORDS.

BULLS OVER THREE YEARS OLD.

First prize, Erastus Corning, Albany, N. Y.; Taurus, red with white face, calved April, 1868, bred by exhibitor; sire Major, dam Victoria by S. Goddard, gr. d. Victoria 4th by Cardinal Wiseman 30

COWS OVER THREE YEARS OLD.

First prize, Erastus Corning, Albany, N. Y.; Victoria 5th, red with white face, calved August, 1859, bred by exhibitor; sire S. Goddard, dam Victoria 4th by Cardinal Wiseman, gr. d. Victoria 1st (imp.)...... 30

E. H. HYDE, *Stafford, Conn.*
B. H. ANDREWS, *Waterbury, Conn.*

NO. 4. AYRSHIRES.

AYRSHIRE HERD PRIZE.

Sturtevant Brothers, South Framingham, Mass., Large Gold Medal.

Bull, Waushakum;

Dark red and white, calved July 31, 1871, bred by exhibitor; sire Habbie Simpson 595, dam Model of Perfection, imported by J. H. Morgan, Ogdensburgh, N. Y.

Cow, Model of Perfection;

Light red and white, calved 1865, bred by Robert Wilson, Kilbarchan, Scotland.

Cow, Georgie;

Red and white, calved 1866, bred by James Wilson, Boghall, Houston, Scotland.

Heifer, Sea Bird;

Red, flecked with white, calved May 13, 1871, bred by J. H. Morgan, Ogdensburgh, N. Y.; sire President (in Scotland), dam Georgie (imp.)

Heifer, Tabby;

Red and white, calved January 27, 1872, bred by exhibitor; sire Malcolm 254, dam Twinney (imp.)

Heifer, Georgiana;

Dark red and white, calved June 17, 1872, bred by exhibitor; sire MacMalcolm 724, dam Georgie (imp.)

BULLS OVER THREE YEARS OLD.

First prize, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Woodville Chief, red and white, calved May, 1870, bred by M. Robertson, Scotland; sire General Lee, dam Beauty 2nd by Kilburn............. $30

Second, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Duke of Hamilton, red and white, calved July, 1870, bred by Mr. Kirkwood, Scotland; sire Gilpin, dam Mary, 20

BULLS TWO YEARS OLD.

Second prize, Sturtevant Brothers, South Framingham, Mass.; Waushakum, dark red and white, calved July 31, 1871, bred by exhibitors; sire Habbie Simpson 595, dam Model of Perfection, imported by J. H. Morgan, Ogdensburgh, N. Y..................... 20

BULLS ONE YEAR OLD.

First prize, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Fearnot, red and white, calved March 30, 1872, bred by J. F. Converse, Woodville, N. Y.; sire Woodville Chief, dam Ayrshire Queen by General Grant 176, gr. d. Flora Temple 3rd by John Gilpin 222 25

Second, S. D. Hungerford, Adams, N. Y.; Scottish Chief, red and white, calved March 1, 1872, bred by exhibitor; sire Abe Lincoln 404, dam Challenge 8th by Cashier 464, gr d. Challenge (imp.)............. 15

Third, S. D. Hungerford, Adams, N. Y.; Uncle Sam, red and white, calved April 22, 1872, bred by exhibitor; sire Abe Lincoln 404, dam Hattie by Cashier 464, gr. d. Challenge 5th by Tiger 376....... 10

BULL CALVES.

First prize, Sturtevant Brothers, South Framingham, Mass.; Milo, red and white, calved June 7, 1873, bred by exhibitors; sire Waushakum, dam Model of Perfection (imp.)................................ 20

Second, Frank D. Curtis, Charlton, N. Y.; Duke of Charlton, red and white, calved March 27, 1873, bred by exhibitor; sire Heber Kimball 605, dam Diana 2nd by Doon 151, gr. d. Diana bred by Wm. Watson, West Farms, N. Y. $10

COWS OVER THREE YEARS OLD.

First prize, Sturtevant Brothers, South Framingham, Mass.; Georgie, red and white, calved 1866, bred by James Wilson, Boghall, Houston, Scotland 30

Second, Frank D. Curtis, Charlton, N. Y.; Matchless 4th, red and white, calved February 16, 1866, bred by C. I. Hayes, Unadilla, N. Y.; sire Doon 151, dam Matchless by Dandy 7th, gr. d. Maggie by Dundee 20

Third, S. D. Hungerford, Adams, N. Y.; Bessie 3rd, red and white, calved June 18, 1863, bred by exhibitor; sire Tiger 376, dam Bessie by Kilburn 229, gr. d. White Lily (imp.) 10

HEIFERS TWO YEARS OLD.

First prize, Sturtevant Brothers, South Framingham, Mass.; Sea Bird, red flecked with white, calved May 13, 1871, bred by J. H. Morgan, Ogdensburgh, N. Y.; sire President (in Scotland), dam Georgie (imp.) 30

Second, R. P. Williams, Belleville, N. Y.; Dolly Varden, red and white, calved May, 1871, bred by J. F. Converse, Woodville, N. Y.; sire General Grant 176, dam Rosa 3rd by John Gilpin 222, gr. d. Rosa 20

Third, Sturtevant Brothers, South Framingham, Mass.; Olee, red and white, calved February 16, 1871, bred by exhibitors; sire Malcolm 254, dam Ops (imp.) 10

HEIFERS ONE YEAR OLD.

First prize, Sturtevant Brothers, South Framingham, Mass.; Tabby, red and white, calved January 27, 1872, bred by exhibitors; sire Malcolm 254, dam Twinney (imp.) 25

Second, Frank D. Curtis, Charlton, N. Y.; Polyanthus, red and white, calved April 8, 1872, bred by C. S. Lester, Saratoga Springs, N.Y.; sire St. Cuthbert 872, dam Marian by Tam 72, gr. d. Nannie by Norribo 50.. 15

Third, S. D. Hungerford, Adams, N. Y.; Linnie, red and white, calved February 19, 1872, bred by exhibitor; sire Abe Lincoln 404, dam Jessie by Cashier 464, gr. d. Bessie 2nd by Tiger 376 10

HEIFER CALVES.

First prize, S D. Hungerford, Adams, N. Y.; Eliza, red and white, calved October 6, 1872, bred by exhibitor; sire Abe Lincoln 404, dam Bessie 3rd by Tiger 376, gr. d. Bessie by Kilburn 229 20

Second, Sturtevant Brothers, South Framingham, Mass.; Lady Kilbirnie 2nd, red and white, calved May 31, 1873, sire Waushakum, dam Lady Kilbirnie (imp.) 10

C. T. HULBURD, *Brasher Falls, N. Y.*
E. T. MILES, *Fitchburg, Mass.*

No. 5. JERSEYS.

JERSEY HERD PRIZE.

Erastus Corning, Albany, N. Y., Large Gold Medal.

Bull, Torrent;

Dark gray, black points, calved November 7, 1871, bred by exhibiior; sire Mercury 432, dam Edna by Taintor's Bull 306, gr. d. Taintor's imported Flora.

Cow, Edna;

Silver gray, calved March 6, 1859, bred by John A. Taintor, Hartford, Conn.; sire Taintor's imported Bull of 1858 306, dam Taintor's imported Flora.

Cow, Sophia;

Dark fawn, calved March, 1867, bred by exhibitor; sire Romeo, dam Cream Violet (imp.).

Cow, Maggie;

Dark fawn, calved April, 1867, bred by exhibitor; sire Romeo, dam Lady Eva.

Cow, Cream Violet 2nd;

Yellow and white, calved June 18, 1868, bred by exhibitor; sire Romeo, dam Cream Violet (imp.).

Heifer, Nancy;

Fawn and white, calved March, 1871, bred by exhibitor; sire Champion, dam Maggie by Romeo, gr. d. Lady Eva.

BULLS OVER THREE YEARS OLD.

First prize, J. Carter Brown 2nd, East Greenwich, R. I.; Mogul, squirrel gray and black, calved September, 1869, bred by Mr. Le Gallais, of the Isle of Jersey; sire Mr. Le Gallais' Bull, dam (imported) Mischief.... $30

Second, W. B. Dinsmore, Staatsburgh, N. Y.; Yankee, solid light fawn, calved 1870, imported by exhibitor 20

Third, Edward Burnett, Southborough, Mass.; Albion, dark fawn, calved August 30, 1868, bred in Jersey, dam Bonfanti (imp.) 10

BULLS TWO YEARS OLD.

First prize, Joseph Sweet, Unadilla, N. Y.; Paddy, calved September, 1871, bred by M. De La Cœur, in Jersey, imported by Capt. Pratt, of ship Hudson 30

Second, Thomas J. Hand, Sing Sing, N.Y.; Marius, gray, calved April 23, 1871, bred by exhibitor; sire Willie Boy 434, dam Lady Mary, imported by W. H. Schieffelin, of New York 20

Third, Frank D. Curtis, Charlton, N. Y.; Touchstone 2nd, brown, white patch on shoulder, calved February 4, 1871, bred by William Crozier, Northport, N. Y.; sire Touchstone 315, dam Zillah by Pluto 232, gr. d. Zanetta by Nameless 212 10

Bulls One Year Old.

First prize, Joseph Sweet, Unadilla, N. Y.; Noble, calved April 17, 1872, imported by Capt. Pratt, of ship Hudson, in dam Fanny of Babylon........................... $25

Second, J. Howard McHenry, Pikesville, Md.; Asteroid, fawn, calved January 10, 1872, bred by exhibitor; sire Clement 115, dam Lilac by Potomac 153, gr. d. Fawn by Prince John 22............................. 15

Bull Calves.

First prize, W. B. Dinsmore, Staatsburgh, N. Y.; Peter, silver gray and white, calved December 26, 1872, bred by John Remon in Jersey; sire Yankee, dam Princess of Normandy by Napier..................... 20

Second, J. Carter Brown 2nd, East Greenwich, R. I.; Mogador, black and tan, calved December 22, 1872, bred by exhibitor; sire Mogul 568, dam Cocoanut by Touchstone 315, gr. d. Zillia 2nd by Beacon Comet 676, 10

Cows over Three Years Old.

First prize, Edward Burnett, Southborough, Mass.; Daisy, fawn, calved in 1865, bred by Dr. Joseph Burnett, of the same place; sire Czar 373, dam Fanny, imported by Dr. Burnett.............................. 30

Second, Thomas J. Hand, Sing Sing, N.Y.; Emblem, gray, calved February, 1878, bred by Edward Gibaut, in Jersey; sire Clement 115................................ 20

Third, E. Corning Albany, N. Y.; Edna, silver gray, calved March 6, 1859, bred by John A. Taintor, Hartford, Conn.; sire Taintor's imported Bull of 1858, 306, dam Taintor's imported Flora....................... 10

Heifers Two Years Old.

First prize, Frank D. Curtis, Charlton, N. Y.; Princess Caroline 1st, fawn and white, calved July 8, 1871, bred by exhibitor; sire Hero 840, dam Caroline 2nd (imp.)...... 30

Second, J. Carter Brown 2nd, East Greenwich, R. I.; Madeline 2nd, gray fawn, calved February 1, 1871, bred by Capt. F. Perrie, of the Isle of Jersey; sire Perrot, dam Madeline................................ 20

Third, Thomas J. Hand, Sing Sing, N. Y.; Emily Hampton, dark French gray, calved July 11, 1871, bred by exhibitor; sire Southampton 117, dam Emblem (imp.).... 10

Heifers One Year Old.

First prize, Thomas J. Hand, Sing Sing, N.Y.; Zodiac, almond fawn, calved April 2, 1872, bred by exhibitor; sire Euclid 520, dam Zenith by Southampton 117, gr. d. Emblem (imp.)............................. 25

Second, Edward Burnett, Southborough, Mass.; Lulu, fawn, calved November 13, 1871, bred by exhibitor; sire Jersey Boy 272, dam Lilla by J. P. Cushing's Black Dick, gr. d. Buttercup by Major 3rd 320............ 15

Third W. L. & W. Rutherford, Waddington, N. Y.; Genisse, gray fawn, calved May 9, 1872, bred by exhibitors; sire Dandy 269, dam Victoria by Ned, gr. d. Jessie (imp.), $10

Heifer Calves.

First prize, J. Carter Brown 2nd, East Greenwich, R. I.; Countess of Normandy, fawn, calved March 9, 1873, bred by Nicholas Arthur, of the Isle of Jersey; sire Duke of Normandy, dam Young Pansy by Orange Peel (129), gr. d. Pansy................ 20

Second, Thomas J. Hand, Sing Sing, N. Y.; Empress, fawn, calved July 10, 1873, bred by exhibitor; sire Marius 760, dam Emblem (imp.)............................... 10

W. H. Van Buren, *Shrewsbury, N. J.*
J. W. Wadsworth, *Geneseo, N. Y.*

No. 6. Holsteins.

HOLSTEIN HERD PRIZE.

Gerrit S. Miller, Peterboro, N. Y., Large Gold Medal.

Bull, Rip Van Winkle;

Black and white, calved April 18, 1870, bred by exhibitor; sired in West Friesland, imported by by exhibitor in cow Fraulein.

Cow, Dowager;

Black and white, calved in 1864, imported by exhibitor from Holland in 1869.

Cow, Crown Princess;

Black and white, calved in 1865, imported by exhibitor from Holland in 1869.

Cow, Fraulein;

Black and white, calved in 1866, imported by exhibitor from Holland in 1869.

Heifer, Hebe;

Black and white, calved May 7, 1871, bred by exhibitor; sire Hollander 20, dam Fraulein, imported by exhibitor.

Heifer, Aster.

Black and white, calved September 15, 1872, bred by exhibitor; sire Hollander 20, dam Dowager, imported by exhibitor.

Bulls over Three Years Old.

First prize, Gerrit S. Miller, Peterboro, N. Y.; Rip Van Winkle, black and white, calved April 18, 1870; sired in West Friesland, imported by exhibitor in cow Fraulein.... $30

Second, Thomas B. Wales, Jr., South Framingham, Mass.; Van Tromp 2nd, black and white, calved February 4, 1869, bred by W. W. Chenery, Belmont, Mass.; sire, Van Tromp (imp.), dam Texelaar 3rd, by 2nd Dutchman 37, gr. d. Texelaar, imported by W. W. Chenery, Belmont, Mass., in 1861. 20

Third, Henry Waterman, Providence, R. I.; Opperdoes 7th, black and white, calved July 23, 1866, bred by W. W. Chenery, Belmont, Mass.; sire Van Tromp 50, dam Opperdoes 2nd by 2nd Dutchman 37, gr. d. Maid of Opperdoes (imp.)............... $10

Bulls over Two Years Old.

First prize, H. C. Hoffman, Horseheads, N. Y.; 4th Earl of Middlesex, white with black spots, calved March 4, 1871, bred by W. W. Chenery, Belmont, Mass.; sire Texelaar 6th 44, dam Zuider Zee (imp.)...... 30

Bulls One Year Old.

First prize, H. C. Hoffman, Horseheads, N. Y.; Holland Prince, black and white, calved October 30, 1871, bred by Jacob Docts, of Beemster, North Holland; sire Beemster District Bull, dam Holland Queen 25

Second, Thomas B. Wales, Jr., South Framingham, Mass.; Van Tromp 4th, black and white, calved May 10, 1872, bred by exhibitor; sire Van Tromp 2nd 52, dam Maid of Opperdoes, imported by W. W. Chenery in 1861......................... 15

Bull Calves.

First prize, H. C. Hoffman, Horseheads, N. Y.; (not named), black and white, calved December 17, 1872, bred by exhibitor; sire Ellswout, (imp. in 1871), dam Holland Queen (imp. in 1871).................. 20

Second, Thomas B. Wales, Jr., South Framingham, Mass.; Van Tromp 5th, black and white, calved April 16, 1873, bred by exhibitor; sire Van Tromp 2nd 52, dam Zuider Zee 9th, by Van Tromp, 50, gr. d. Zuider Zee (imp.)........................... 10

Cows over Three Years Old.

First prize, Gerrit S. Miller, Peterboro, N. Y.; Crown Princess, black and white, calved in 1865, imported by exhibitor from Holland, in 1869.............................. 30

Second, Gerrit S. Miller, Peterboro, N. Y.; Fraulein, black and white, calved in 1866, imported by exhibitor from Holland, in 1869 20

Third, H. C. Hoffman, Horseheads, N. Y.; Holland Queen, black and white, calved in 1864, bred by Jacob Docts, Beemster, North Holland; sire Beemster District Bull (imp. in 1871).................... 10

Heifers Two Years Old.

First prize, Thomas B. Wales, Jr., South Framingham, Mass.; Maid of Holstein, black and white, calved March 12, 1871, bred by exhibitor; sire Opperdoes 7th 32, dam Maid of Opperdoes, imported by W. W. Chenery in 1861...................... 30

Second, Gerrit S. Miller, Peterboro, N. Y.; Hebe, black and white, calved May 7, 1871, bred by exhibitor; sire Hollander 20, dam Fraulein, imported by exhibitor.......... 20

Heifers One Year Old.

First prize, Gerrit S. Miller, Peterboro, N. Y.; Juno, white and black, calved March 4, 1872, bred by exhibitor; sire Hollander 20, dam Crown Princess, imported by exhibitor $25

Second, Gerrit S. Miller, Peterboro, N. Y.; Aster, black and white, calved September 15, 1872, bred by exhibitor; sire Hollander 20, dam Dowager imported by exhibitor .. 15

Third, Henry Waterman, Providence, R. I.; Susette, black and white, calved June 18, 1872, bred by exhibitor; sire Duke of Belmont, 5, dam Midwould 10th, by Opperdoes 7th 32, gr. d. Midwould 6th by Zuider Zee 2nd 57...................... 10

Heifer Calves.

First prize, Thomas B. Wales, Jr., South Framingham, Mass.; Dora, black and white, calved March 20, 1873, bred by exhibitor; sire Van Tromp 2nd 52, dam Maid of Opperdoes, imported by W. W. Chenery, in 1861 20

Second, Henry Waterman, Providence, R. I.; Hildegarde, black and white, calved November, 1872, bred by exhibitor; sire Opperdoes 7th 32, dam Texelaar 3rd by 2nd Dutchman 37, gr. d. Texelaar (imp.).... 10

The Holstein exhibition, in numbers and high qualities, fine milking, and beef or flesh points, surprised and delighted the judges, as it did many cattlemen who were on the grounds. If to-day's exhibition is a fair criterion of what the breed can do, it is one of much promise.

C. T. Hulburd, *Brasher Falls, N. Y.*
E. T. Miles, *Fitchburg, Mass.*

No. 7. Milch Cows and Grades.

Milch Cows.

First prize, S. D. Hungerford, Adams, N. Y.; Old Creamer, cream and white, calved in 1864, bred by —— Smith, Napanee, Ont.; sire an Ayrshire bull, dam ½ Ayrshire, ½ Short Horn......................... $30

Second, H. C. Hoffman, Horseheads, N. Y.; Janeka, white, calved March, 1867, bred by Jacob Docts, North Holland; sire Beemster District Bull 20

Third, Brodie, Son & Converse, Rural Hill and Woodville, N. Y.; Ayrshire cow Brighteyes, red and white, 6 years, bred by J. F. Converse, Woodville, N. Y.; sire John Gilpin 222, dam Flirt by Patchen 290½.......... 10

Grade Short Horn Cows and Heifers.

First prize, Wm. F. Blanchard, Manlius, N. Y.; Atlanta, roan, calved April 20, 1871, bred by exhibitor; sire Treble Gloster 7331, dam roan cow by Fanny 2nd's Gloster 3923.... 20

Second, F. Wood Gray, Quebec, Canada; Winter's Morn, roan, 8 years, bred by J. Ashworth, Ottawa; sire Sweetmeat (20924), dam Sylph.............................. 15

Third, David K. Bell, West Brighton, N. Y.; Lady Darling, red and white, calved May 6, 1864, bred by Joseph Williams, West Henrietta, N. Y.; sire Short Horn, dam grade Short Horn $10

Grade Devon Cows and Heifers.

Second prize, William Mattoon, Springfield, Mass.; Florence, red, calved June 10, 1872, bred by exhibitor; sire Springfield 342.... 15

Grade Ayrshire Cows and Heifers.

First prize, Joseph Juliand, Bainbridge, N. Y.; Bonnie, speckled, calved 1871; sire Jersey Bull, dam Ayrshire 20

Second, E. B. Hawks, Wells Bridge, N. Y.; Minnie, red and white, calved April 5, 1864, bred by exhibitor; sire Dandy (Ayrshire), dam Ayrshire and Devon.......... 15

Third, E. B. Hawks, Wells Bridge, N. Y.; Minnie 3rd, red and white, calved April 12, 1872, bred by exhibitor; sire Lord Cuthbert (Ayrshire), dam Minnie (¾ Ayrshire), 10

Grade Jersey Cows and Heifers.

First prize, Charles W. Little, Watervliet, N. Y.; Bessie, light fawn and white, 8 years; sire Hero, a Jersey Bull, dam grade Jersey 20

Second, Ira Harris, Loudonville, N. Y.; Olcott, 3 years, ¾ Jersey, bred by Thomas Olcott, Albany, N. Y.......... 15

Third, Joseph Juliand, Bainbridge, N. Y.; Fanny Rotch, fawn and white, calved April, 1869, bred by Francis Rotch, Morris, N. Y.; sire his Jersey Bull, dam a Short Horn cow.......... 10

No. 8. Oxen, Steers and Fat Cattle.

Working Oxen over Five Years Old.

First prize, Joseph Hilton, New Scotland, N. Y.; Devons, 7 years.......... 20

Fat Oxen over Four Years Old.

First prize, Chas. F. Wadsworth, Geneseo, N. Y.; red, 4 years.......... 20

Fat Heifers Three Years Old or Under.

Second prize, O. Howland, Auburn, N. Y...... 15

Third, Joseph Juliand, Bainbridge, N. Y.; grade Devon.......... 10

Extra Award.

G. L. Fletcher, Sidney, Del. Co., N. Y.; pair of trained Yearling Steers.......... 10

G. W. Ostrander, *Hoosick Falls, N. Y.*
Wm. E. Arnold, *Otego, N. Y.*

Class II.—HORSES.

No. 9. Breeding and Growing Stock.

Stallions for General Purposes.

Special Premium for the best Stallion for General Purposes, over Six Years Old, and not less than 15 hands 3 inches high, that has been kept for Mares the past Season, and has served not fewer than Fifteen. Open to all Stallions in the United States and Canada.

Leander Clark, Newburgh, N. Y.; Country Gentleman, bay, 15.3¼, 12 years; by Rysdyk's Hambletonian, dam by Highlander..$100

Stallions for General Purposes, each to be accompanied by not less than five of his Produce One Year Old or Over; the merits of both Sire and Produce to be considered.

First prize, Isaiah Rynders, Passaic, N. J.; Aberdeen, bay, 15.3¼, 7 years; by Hambletonian, dam Widow Machree by American Star, gr. d. by Abdallah....Large Gold Medal.

Second, Timothy T. Jackson and James F. Frost, Washington Hollow, N. Y.; Superb, black, 15.3, 43 years; by Ethan Allen, dam by Harris' Hambletonian, gr. d. by Tippoo Saib.......... $30

Draught Stallions over Five Years Old.

First prize, Samuel T. Howard, Le Roy, N. Y.; Lancer, dapple grey, 16.1¾, 5 years; Percheron, bred by M. Mariere, of the Commune of E. Couches, France.......... 30

Second, Alexander Henderson, Syracuse, N. Y.; Speed the Plough, gray 16.1, 8 years; by an imported Clydesdale stallion.......... 20

Draught Stallions Under Three Years.

First prize, H. & R. Beith, Darlington, Canada; Gleniffer, bay 16, 2 years; sire Sir Walter Scott (imp.), dam Fanny by London Tam (imp), gr. d. by Bay Wallace.......... 20

Draught Mares With Foals at Foot.

First prize, William Jackson, Fosterville, N. Y.; Doll, bay, 13 years, by Sampson 3rd, dam Mag by imported Honest Tom, gr. d. Doll by Louis Phillipe.......... 30

Draught Fillies Under Five and Over Three Years.

First prize, H. & R. Beith, Darlington, Canada; Kate, bay, 3 years; sire Netherby, dam Jess by Clyde.......... $25

Draught Fillies Under Three Years.

Second prize, S. A. Mason, Windsor, N. Y.; cream, 2 years.......... 10

Carriage Stallions Over Five Years Old and Not Less Than 15.3.

First prize, Leander Clark, Newburgh, N. Y.; Country Gentleman, bay, 15.3¼, 12 years; by Rysdyk's Hambletonian, dam by Highlander.......... $30

Second, Edwin Thorne, Thorndale, N. Y.; Cavalier, brown, 15.3, 5 years; by Hamlet, dam by Wadsworth's Henry Clay............ $20

CARRIAGE STALLIONS UNDER FIVE AND OVER THREE YEARS OLD.

First prize, William Jackson, Fosterville, N. Y.; British Yeoman, bay, 3 years; by Sir Henry, dam Doll by Sampson 3rd, gr. d. Mag by imported Honest Tom.................. $25

Second, John M. Newton, Albany, N. Y.; Crusader, bay, 15.3½, 4 years; by Mambrunello, dam Lady Patriot 15

CARRIAGE STALLIONS UNDER THREE YEARS.

First prize, Edwin Thorne, Thorndale, N. Y.; Thorndale Jr., bay, 15.2, 2 years; by Thorndale, dam Daisy by Burr's Washington, gr. d. by old Abdallah.............. $20

Second, George Lasher, Mariaville, N. Y; Waxy Morgan, chestnut, 15.3, 2 years; by Waxy, dam Morgan........................... 10

CARRIAGE MARES NOT LESS THAN 15.3 WITH FOALS AT FOOT.

First prize, Barent Van Alen, Malden Bridge, N. Y.; bay, 16, 10 years; Bashaw and Messenger.................................. $30

CARRIAGE FILLIES UNDER FIVE AND OVER THREE YEARS OLD.

First prize, Ezra J. Clark, Belleville, N. Y.; dark bay, 15.2, 4 years................. $25

Second, R. H. Sabin, West Troy, N. Y.; 3 years 10

ROADSTER STALLIONS FIVE YEARS OLD OR OVER.

First prize, Edwin Thorne, Thorndale, N. Y.; Thorndale, bay, 15.2, 8 years; by Alexander's Abdallah, dam by Mambrino Chief, gr. d. by Saxe Weimar.................. $30

Second, David Baird, Springfield Centre, N. Y.; Victor, bay, 15.2½, 18 years; by Biggarts' Rattler, dam by Harris's Hambletonian... 20

ROADSTER STALLIONS UNDER FIVE AND OVER THREE YEARS.

First prize, S. D. Hungerford, Adams, N. Y.; Lord Chesterfield, brown, 3 years; by Sentinel, dam Black Bess by Hill's Black Hawk, gr. d. by Turk.................. $25

Second, Paul S Forbes, Bath-on-Hudson N. Y.; Grand Duke, bay, 15.1, 3 years; by Iron Duke, dam Kathleen by Trustee.......... 15

ROADSTER STALLIONS UNDER THREE YEARS OLD.

First prize, Edwin Thorne, Thorndale, N. Y.; Sharpshooter, chestnut, 15.2, 2 years; by Thorndale, dam Lady Patriot............ $20

Second, Isaiah Rynders, Passaic, N. J.; Killarney, bay, 2 years; by Aberdeen, dam by Alexander's Abdallah................. 10

ROADSTER MARES WITH FOALS AT FOOT.

First prize, Edwin Thorne, Thorndale, N. Y.; Lady Patriot, bay, 15.2, 23 years; by Young Patriot, dam Hulse mare, bay colt foal by Thorndale $30

Second, D. B. Haight, Dover Plains, N. Y.; Kitty Carson, by Wilderness, dam Kate Haggerty by Toronto; foal by Goldsmith. 20

ROADSTER FILLIES UNDER FIVE AND OVER THREE YEARS.

First prize, George H. Charles, Albany, N. Y.; dark bay, 15.3, 4 years, by Americus..... $25

Second, John Young, Syracuse, N. Y.; Rose, 15.3, 4 years, by Lysander, dam by Oakley's Black Hawk...................... 15

ROADSTER FILLIES UNDER THREE YEARS OLD.

First prize, Hiram Chapman, Amenia, N. Y.; 2 years.............................. $20

Second, Dean Sage, Albany, N. Y.; bay, 2 years; by Aberdeen, dam Mr. Low's Ariel by Ethan Allen, gr. d. by Harris's Hambletonian.............................. 10

No. 10. WORK HORSES.

PAIRS OF DRAUGHT HORSES, WEIGHING OVER 2,500 POUNDS THE PAIR.

First prize, William Jackson, Fosterville, N. Y.; Charlie and Billy, gray, 5 and 6 years; sire Grey Messenger, dam Doll........... $30

PAIRS OF CARRIAGE HORSES, OVER 16 HANDS HIGH, AND NOT LESS THAN 2,400 POUNDS WEIGHT.

First prize, Hiram Wheeler, Albany, N. Y.; bay and chestnut, 7 and 8 years $30

PAIRS OF CARRIAGE HORSES NOT LESS THAN 15.3, NOR MORE THAN 16.1.

First prize, Timothy T. Jackson and James F. Frost, Washington Hollow, N. Y.; blacks, 15.3, 4 and 6 years, by Superb.......... 30

Second, Thomas McCarty, Albany, N. Y.; brown, 16, 7 years..................... 15

PAIRS OF LIGHT CARRIAGE HORSES, LESS THAN 15.3 AND NOT LESS THAN 15 HANDS.

First prize, M. E. Williams, Chatham Village, N. Y.; bays, 15.2½, 5 and 7 years........ 30

Second, Jackson and Frost, Jamaica, L. I.; bays, 3 years, by Superb............... 15

CART HORSES OVER 1,200 POUNDS WEIGHT.

First prize, John Young, Syracuse, N. Y.; Napoleon, gray, 18, 7 years, by Canada Champion, dam of Messenger stock...... 20

Second, E. J. Wendell, Albany, N. Y.; bay mare 16, 8 years............................ 10

SINGLE HARNESS HORSES 15.3 OR OVER.

First prize, George W. Van Valkenburgh, Malden Bridge, N. Y.; bay, 15.3, 3 years; sire Morgan, dam Jackson stock......... 20

Second, Dean Sage, Albany, N. Y.; bay, 8 years, by Hambletonian, dam by Mambrino Chief, gr. d., by Dunkin's Mambrino Messenger 10

SINGLE HARNESS HORSES, 15, AND LESS THAN 15.3.

First prize, Dean Sage, Albany, N. Y.; bay, 15.2½, 5 years, by Middletown, dam by Hambletonian $20

Second, A. B. Larkin, Central Bridge, N. Y.; bay, 15.2, 5 years 10

SADDLE HORSES, 15.2 OR OVER.

First prize, William Whipple, Medina, N. Y.; Prince, bay, 15.2, 4 years 20

SADDLE HORSES 14.3 AND LESS THAN 15.2.

First prize, J. Edgar Payne, Franklin, N. Y.; Don Quixote, parti-coloured, bay, black and white, 15.1½, 8 years; sire Spotted Chief. 20

Second, Darwin Fuller, Medina, N. Y.; May, gray, 4 years 10

SADDLE HORSES 14 HANDS AND LESS THAN 14.3.

Second prize, J. W. Cox, M. D., Albany, N. Y.; gray, 9 years 10

PONIES UNDER 14 HANDS.

First prize, Dean Sage, Albany, N. Y.; imported from Central America 20

Second, Miss Emma E. Juliand, Bainbridge, N. Y,; Gipsy, bay, 13.2, 7 years; sire Doctor Kane, dam a Star mare 10

CLASS III.—SHEEP, SWINE AND POULTRY.

No. 12. FAT SHEEP.

LONG-WOOLLED, OVER TWO YEARS OLD.

First prize, George Ingersoll, Charleston, N. Y.; (ewe) $5

Second, M. H. Kenneally, Albany, N. Y.; 3 years 3

Third, O. Howland, Auburn, N. Y 1

MIDDLE WOOLLED OVER TWO YEARS OLD.

First prize, Frank B. Redfield, Batavia, N. Y .. 5

Second, Joseph Juliand, Bainbridge, N. Y 3

Third, Frank B. Redfield, Batavia, N. Y 1

MIDDLE WOOLLED UNDER TWO YEARS OLD.

First prize, Joseph Juliand, Bainbridge, N. Y .. 5

Second, Frank B. Redfield, Batavia, N. Y 3

Third, O. Howland, Auburn, N. Y 1

CROSS-BRED OVER TWO YEARS OLD.

First prize, Joseph Juliand, Bainbridge, N. Y., 5

Second, O. Howland, Auburn, N. Y 3

Third, O. Howland, Auburn, N. Y 1

No. 13. LONG-WOOLLED SHEEP.

LEICESTER RAMS OVER TWO YEARS OLD.

First prize, W. L. & W. Rutherford, Waddington, N. Y.; 2 years, bred by exhibitors .. 15

Second, Jurian Winne, Bethlehem Centre, N. Y.; bred by exhibitor 10

Third, Jurian Winne, Bethlehem Centre, N. Y.; bred by exhibitor $5

YEARLING RAMS.

First prize, George Ingersoll, Charleston, N. Y., 15

Second, Jurian Winne, Bethlehem Centre, N.Y.; bred by exhibitor 10

Third, W. L & W. Rutherford, Waddington, N. Y.; bred by McPherson & Ferguson in Scotland 5

PENS OF (THREE) RAM LAMBS.

First prize, W. L. & W. Rutherford, Waddington, N. Y 10

Second, Jurian Winne, Bethlehem Centre, N. Y., 5

PENS OF (THREE) EWES OVER TWO YEARS OLD.

First prize, W. L. & W. Rutherford, Waddington, N. Y.; bred by McPherson & Ferguson in Scotland 15

Second, George Ingersoll, Charleston, N. Y ... 10

Third, W. L. & W. Rutherford, Waddington, N. Y 5

PENS OF (THREE) YEARLING EWES.

First Prize, George Ingersoll, Charleston, N. Y., 15

Second, W. L. & W. Rutherford, Waddington, N. Y 10

Third, W. L. & W. Rutherford, Waddington, N. Y 5

PENS OF (THREE) EWE LAMBS.

Frist prize, W. L. & W. Rutherford, Waddington, N. Y 10

Second, George Ingersoll, Charleston, N. Y 5

COTSWOLDS.

RAMS OVER TWO YEARS OLD.

First prize, C. K. Ward & Son, Le Roy, N. Y.; Thorndale, 2 years; bred by R. Lane, Broadfields, Eng 15

Second, Edwin Thorne, Thorndale, N. Y.; bred by R. Lane 10

Third, Edwin Thorne, Thorndale, N. Y.; bred by R. Lane 5

YEARLING RAMS.

First prize, George Ingersoll, Charleston, N. Y., 15

Second, Edwin Thorne, Thorndale, N. Y 10

Third, Hiram K. Burroughs, Roxbury, N. Y.; bred by F. W. Stone, Guelph, Canada 5

PENS OF (THREE) RAM LAMBS.

First prize, Frank D. Ward, Le Roy, N. Y 10

PENS OF (THREE) EWES OVER TWO YEARS OLD.

First prize, Frank D. Ward, Le Roy, N. Y.; bred by R. Lane, Broadfields, England 15

Second, Frank D. Ward, Le Roy, N. Y.; bred by R. Lane, Broadfields, Eng 10

Third, George Ingersoll, Charleston, N. Y.; bred by S. T. Deuel, Dutchess Co., N. Y., 5

PEN OF (THREE) YEARLING EWES.

First prize, George Ingersoll, Charleston, N. Y., $15

PENS OF (THREE) EWE LAMBS.

First prize, Frank D. Ward, Le Roy, N. Y.; bred by J. W. Wadsworth, Geneseo, N. Y., 10
Second, George Ingersoll, Charleston, N. Y.... 5

Your Committee found the three Costwold Rams, exhibited by Messrs. Ward and Thorne, so uniform in quality, that it was difficult to discriminate or make a preference. Three finer sheep were never shown at any fair of this Society; and we deem a special mention in our report due to the exhibitors.

H. C. GREGORY, *Unadilla, N. Y.*
R. S. CHARLES, *Belvidere, N. Y.*

No. 14. MIDDLE WOOLLED SHEEP.

SOUTH DOWNS.

RAMS OVER TWO YEARS OLD.

First prize, Frank B. Redfield, Batavia, N. Y.. $15
Second, D. B. Haight, Dover Plains, N. Y..... 10
Third, D. B. Haight, Dover Plains, N. Y...... 5

YEARLING RAMS.

First prize, John Lynch, West Brighton, N. Y., 15
Second, Joseph Juliand, Bainbridge, N. Y..... 10

PENS OF (THREE) RAM LAMBS.

First prize, D. B. Haight, Dover Plains, N. Y., 10
Second, John Lynch, West Brighton, N. Y.... 5

PENS OF (THREE) EWES OVER TWO YEARS.

First prize, Joseph Juliand, Bainbridge, N. Y.. 15
Second, D. B. Haight, Dover Plains, N. Y..... 10
Third, John Lynch, West Brighton, N. Y..... 5

PENS OF (THREE) YEARLING EWES.

First prize, D. B. Haight, Dover Plains, N. Y., 15
Second, John Lynch, West Brighton, N. Y.... 10
Third, Frank B. Redfield, Batavia, N. Y...... 5

PENS OF (THREE) EWE LAMBS.

First prize, D. B. Haight, Dover Plains, N. Y.. 10
Second, John Lynch, West Brighton, N. Y.... 5

SHROPSHIRE DOWNS.

RAMS TWO YEARS OLD.

First prize, L. C. Fish, Otego, N. Y.; imported by George Miller.............. 15
Second, J. Carter Brown 2nd, East Greenwich, R. I.................................... 10

YEARLING RAMS.

First prize, L. C. Fish, Otego, N. Y.; Billy, bred by exhibitor...................... 15

PENS OF (THREE) EWES.

First prize, L. C. Fish, Otego, N. Y.; bred by exhibitor............................ $15
Second, J. Carter Brown 2nd, East Greenwich, R. I.................................... 10

H. SOMERVILLE, *New York City.*
J. McD. McINTYRE, *Linlithgow, N. Y.*

No. 15. MERINOS.

A.—BRED FOR FINENESS OF WOOL.

RAMS OVER TWO YEARS OLD.

First prize, Carl Heyne, Red Hook, N. Y...... 15
Second, William Chamberlain, Red Hook, N. Y., 10
Third, William Chamberlain, Red Hook, N. Y., 5

YEARLING RAMS.

First prize, Carl Heyne, Red Hook, N. Y...... 15
Second, William Chamberlain, Red Hook, N. Y., 10
Third, William Chamberlain, Red Hook, N. Y., 5

PENS OF (THREE) RAM LAMBS.

First prize, William Chamberlain, Red Hook, N. Y.................................. 15
Second, Carl Heyne, Red Hook, N. Y......... 10

PENS OF (THREE) EWES OVER THREE YEARS OLD.

First prize, William Chamberlain, Red Hook, N. Y.................................. 15
Second, Carl Heyne, Red Hook, N. Y......... 10
Third, William Chamberlain, Red Hook, N. Y., 5

PENS OF (THREE) EWES OVER TWO YEARS OLD.

First prize, William Chamberlain, Red Hook, N. Y.................................. 15
Second, William Chamberlain, Red Hook, N. Y., 10
Third, Carl Heyne, Red Hook, N. Y.......... 5

PENS OF (THREE) YEARLING EWES.

First prize, Carl Heyne, Red Hook, N. Y...... 15
Second, William Chamberlain, Red Hook, N. Y., 10
Third, William Chamberlain, Red Hook, N. Y., 5

PENS OF (THREE) EWE LAMBS.

First prize, Carl Heyne, Red Hook, N. Y...... 10
Second, William Chamberlain, Red Hook, N. Y., 5

B.—BRED FOR WEIGHT OF FLEECE.

RAMS OVER TWO YEARS OLD.

First prize, Lusk & Townsend, Batavia, N. Y.; bred by J. E. Parker.................. 15
Second, Roggey & Harrison, Hoosick Falls, N. Y.................................. 10
Third, William Chamberlain, Red Hook, N. Y., 5

YEARLING RAMS.

First prize, E. Townsend, Pavilion Centre, N. Y., 15
Second, William Chamberlain, Red Hook, N. Y., 10
Third, Lusk & Townsend, Batavia, N. Y...... 5

PENS OF (THREE) RAM LAMBS.

First prize, William Chamberlain, Red Hook, N. Y. $10
Second, S. B. Lusk, Batavia, N. Y. 5

PENS OF (THREE) EWES OVER THREE YEARS OLD.

First prize, E. Townsend, Pavilion Centre, N. Y.; bred by exhibitor and E. S. Stowell 15
Second, William Chamberlain, Red Hook, N. Y., 10
Third, S. B. Lusk, Batavia, N. Y.; bred by exhibitor 5

PENS OF (THREE) EWES TWO YEARS OLD.

First prize, S. B. Lusk, Batavia, N. Y.; bred by exhibitor 15
Second, William Chamberlain, Red Hook, N. Y., 10
Third, J. M. Bacheldor, Pownal, Vt.; bred by exhibitor. 5

PENS OF (THREE) YEARLING EWES.

First prize, Wm. Chamberlain, Red Hook, N. Y. 15
Second, E. Townsend, Pavilion Centre, N. Y., 10
Third, S. B. Lusk, Batavia, N. Y.; bred by exhibitor. 5

PENS OF (THREE) EWE LAMBS.

First prize, Wm. Chamberlain, Red Hook, N. Y. 10
Second, S. B. Lusk, Batavia, N. Y. 5

C.—BRED FOR LENGTH OF STAPLE (TO PRODUCE DELAINE WOOL).

RAMS OVER TWO YEARS OLD.

First prize, Lusk & Townsend, Batavia, N. Y.; bred by J. E. Parker $15

YEARLING RAMS.

First prize, Zerah Rider, Cambridge, N. Y. 15
Second, E. Townsend, Pavilion Centre, N. Y. ... 10
Third, S. B. Lusk, Batavia, N. Y. 5

PENS OF (THREE) RAM LAMBS.

First prize, S. B. Lusk, Batavia, N. Y. 10
Second, Zerah Rider, Cambridge, N. Y. 5

PENS OF (THREE) EWES OVER THREE YEARS OLD.

First prize, E. Townsend, Pavilion Centre, N. Y., $15
Second, Zerah Rider, Cambridge, N. Y. 10
Third, Lusk and Townsend, Batavia, N. Y.; bred by exhibitors 5

PENS OF (THREE) EWES TWO YEARS OLD.

First prize, Lusk & Townsend, Batavia, N. Y., 15
Second, Zerah Rider, Cambridge, N. Y. 10

PENS OF (THREE) YEARLING EWES.

First prize, S. B. Lusk, Batavia, N. Y. 15
Second, Zerah Rider, Cambridge, N. Y. 10

PENS OF (THREE) EWE LAMBS.

First prize, S. B. Lusk, Batavia, N. Y. $10
Second, Zerah Rider, Cambridge, N. Y. 5

ARBA CAMPBELL, *Otsego, N. Y.*
E. MACKYES, *Onondaga Co., N. Y.*

No. 16. SWINE.

LARGE WHITE BREED.

BOARS TWO YEARS OLD.

First prize, Clark & Green, Belleville, N. Y. $15

BOARS ONE YEAR OLD.

First prize, E. B. Hawks, Wells' Bridge, N. Y.; Cheshire 15
Second, A. L. Thomas, Cuba, N. Y. 10

BOAR SIX MONTHS OLD AND LESS THAN ONE YEAR.

First prize, A. L. Thomas, Cuba, N. Y. $15
Second, Clark & Green, Belleville, N. Y. 10

BREEDING SOWS TWO YEARS OLD.

First prize, J. Thomas, Cuba, N. Y. 15
Second, Peter Van Wie, Cedar Hill, N. Y.; improved Cheshire 10

SOWS ONE YEAR OLD.

First prize, A. L. Thomas, Cuba, N. Y. 15

SOW PIGS OVER SIX MONTHS OLD.

First prize, A. L. Thomas, Cuba, N. Y. 15

PENS OF (FIVE) PIGS UNDER SIX MONTHS OLD.

First page, Clark & Green, Belleville, N. Y. $15
Second, A. L. Thomas, Cuba, N. Y. 10

SMALL WHITE BREED.

BOARS TWO YEARS OLD.

First prize, W. B. Dinsmore, Staatsburgh, N. Y., 15
Second, Frank D. Curtis, Charlton, N. Y. 10

BOARS ONE YEAR OLD.

First prize, T. L. Harison, Morley, N. Y.; Suffolk, bred by D. Magone, Jr. 15
Second, W. B. Dinsmore, Staatsburgh, N. Y., 10

BOARS SIX MONTHS OLD AND LESS THAN ONE YEAR.

First prize, Frank D. Curtis, Charlton, N. Y., $15
Second, L. D. Thomas, Cuba, N. Y. 10

BREEDING SOWS TWO YEARS OLD.

First prize, T. L. Harison, Morley, N. Y.; Suffolk, bred by exhibitor 15
Second, W. B. Dinsmore, Staatsburgh, N. Y., 10

SOWS ONE YEAR OLD.

First prize, T. L. Harison, Morley, N. Y.; Suffolk, bred by exhibitor 15
Second, W. B. Dinsmore, Staatsburgh, N. Y., 10

SOW PIGS SIX MONTHS OLD.

First prize, A. L. Thomas, Cuba, N. Y........ $15
Second, J Thomas, Cuba, N. Y.............. 10

PENS OF (FIVE) PIGS UNDER SIX MONTHS OLD.

First prize, T. L. Harison, Morley, N. Y.; Suffolk.................................. $15
Second, Frank D. Curtis, Charlton, N Y..... 10

JOSEPH HARRIS, *Rochester, N. Y.*
JOSEPH SWEET, *Unadilla, N. Y.*

SMALL BLACK BREED.

BOARS ONE YEAR OLD.

First prize, D. B. Haight, Dover Plains, N. Y.; Lord Lyons 4th, by Lord Lyons 2nd, dam Sal Sliderskew $15

SOWS ONE YEAR OLD.

First prize, D. B. Haight, Dover Plains, N. Y.; Sal Sliderskew 2nd.................... 15

SOW PIGS OVER SIX MONTHS OLD.

First prize, D. B. Haight, Dover Plains, N. Y. 15

BERKSHIRES.

BOARS TWO YEARS OLD.

First prize, D. B. Haight, Dover Plains, N. Y.; Gloucester (imp.) 15
Second, Frank D. Curtis, Charlton, N. Y..... 10

BOARS ONE YEAR OLD.

First prize, Edwin Thorne, Thorndale, N. Y.; bred by exhibitor...................... 15
Second, R. D. Foley, Bowmanville, Canada... 10

BOARS SIX MONTHS OLD AND LESS THAN ONE YEAR.

First prize, R. D. Foley, Bowmanville, Canada 15
Second, H. & R. Beith, Darlington, Canada... 10

BREEDING SOWS TWO YEARS OLD.

First prize, R. D. Foley, Bowmanville, Canada 15
Second, B. F. Denison, Geneseo, N. Y........ 10

SOWS ONE YEAR OLD.

First prize, Joseph Juliand, Bainbridge, N. Y. 15

SOW PIGS OVER SIX MONTHS.

First prize, D. B. Haight, Dover Plains, N. Y.; Cleopatra 2nd, by King William, dam Cleopatra 15
Second, H. & R. Beith, Darlington, Canada... 10

PENS OF (FIVE) PIGS UNDER SIX MONTHS.

First prize, R. D. Foley, Bowmansville, Canada 15
Second, B. F. Denison, Geneseo, N. Y........ 10

J. ASHWORTH, *Ottawa, Canada.*
BENJAMIN SUMNER, *Woodstock, Conn.*

NO. 17. POULTRY.

ASIATIC.

TRIOS LIGHT BRAHAMAS.

First prize, W. A. Fuller, Glen, N. Y......... $5
Second, J. R. Stuyvesant, Poughkeepsie, N. Y. 3

TRIOS DARK BRAHAMAS.

First prize, E. A. Wendell, Albany, N. Y..... 5
Second, W. A. Fuller, Glen, N. Y............ 3

TRIOS BUFF, LEMON OR CINNAMON COCHINS.

First prize, A. B. Humphrey, Weavertown, N. Y.............................. 5
Second, Joseph Juliand, Bainbridge, N. Y..... 3

TRIOS PARTRIDGE OR GROUSE COCHINS.

First prize, J. R. Stuyvesant, Poughkeepsie, N. Y.............................. 5
Second, W. A. Fuller, Glen, N. Y............ 3

TRIOS WHITE COCHINS.

First prize, E. G. Studley, Claverack, N. Y... 5

TRIOS BLACK COCHINS.

Second prize, E. A. Wendell, Albany, N. Y.... 3

DORKINGS.

TRIOS COLOURED DORKINGS.

First prize, Joseph Juliand, Bainbridge, N. Y.. 5
Second, Joseph Juliand, Bainbridge, N. Y.... 3

TRIOS SILVER GRAY DORKINGS.

First prize, O. Howland, Auburn, N. Y....... 5
Second, E. A. Wendell, Albany, N. Y........ 3

TRIOS WHITE DORKINGS.

First prize, E. A. Wendell, Albany, N. Y..... 5
Second, E. A. Wendell, Albany, N. Y........ 3

TRIOS DOMINIQUES.

First prize, O. Howland, Auburn, N. Y....... 5
Second, O. Howland, Auburn, N. Y.......... 3

HAMBURGHS.

TRIOS SPANGLED GOLDEN HAMBURGHS.

First prize, O. Howland, Auburn, N. Y....... 5
Second, W. A. Fuller, Glen, N. Y........... 3

TRIOS SPANGLED SILVER HAMBURGHS.

First prize, George H. Charles, Jr., Albany, N. Y.............................. 5
Second, George H. Charles, Jr., Albany, N. Y. 3

TRIOS PENCILLED GOLDEN HAMBURGHS.

First prize, William E. Kemp, Normanskill, N. Y.............................. 5

TRIOS PENCILLED SILVER HAMBURGHS.

Second prize, E. A. Wendell, Albany, N. Y... 3

Spanish.

Trios Black Spanish.

First prize, E. A. Wendell, Albany, N. Y..... $5
Second, Dewey Brimmer, Albany, N. Y....... 3

Trios White Leghorns (Yellow Legs, Single Combs).

First prize, O. Howland, Auburn, N. Y....... 5
Second, W. A. Fuller, Glen, N. Y............ 3

Trios Plymouth Rocks.

First prize, Silas W. Studley, Catskill Station, N. Y.................................. 5
Second, O. Howland, Auburn, N. Y.......... 3

French.

Trios Crève-Cœurs.

First prize, W. A. Fuller, Glen, N. Y........ 5

Trios Houdans.

First Prize, W. A. Fuller, Glen, N. Y........ 5
Second, E. A. Wendell, Albany, N. Y........ 3

Polish.

Trios White Polish.

First Prize, O. Howland, Auburn, N. Y....... 5

Trios other Polish.

First prize, O. Howland, Auburn, N. Y....... 5
Second, E. A. Wendell, Albany, N. Y........ 3

Games.

Pairs Black Breasted Red Games.

First prize, E. A. Wendell, Albany, N. Y...... 5
Second, W. A. Fuller, Glen, N. Y............ 3

Pairs Brown Breasted Red Games.

First prize, E. A. Wendell, Albany, N. Y..... 5

Pairs Duckwing Games.

First prize, E. A. Wendell, Albany, N. Y..... 5

Pairs Irish Gray or Shawl Neck Games.

First prize, E. A. Wendell, Albany, N. Y.... 5

Pairs other Approved Well-bred Games.

First prize, Dean Sage, Albany, N. Y.......... 5
Second, E. A. Wendell, Albany, N. Y........ 3

Bantams.

Pairs Red Game Bantams.

First prize, E. A. Wendell, Albany, N. Y...... 5
Second, Silas W. Studley, Catskill Station, N.Y., 3

Pairs Pile Game Bantams.

Second prize, Silas W. Studley, Catskill Station, N. Y.................................. 3

Pairs Duckwing Game Bantams.

First prize, Silas W. Studley, Catskill Station, N. Y.................................. 5

Trios Silver-laced Sebright Bantams.

First prize, Silas W. Studley, Catskill Station, N. Y.................................. $5

Trios Gold-laced Sebright Bantams.

First prize, E. A. Wendell, Albany, N. Y..... 5
Second, Geo. H. Charles Jr., Albany, N. Y.... 3

Trios Black Bantams.

First prize, F. D. Curtis, Charlton, N. Y...... 5
Second, Silas W. Studley, Catskill Station, N. Y.................................. 3

Trios Other Bantams.

First prize, E. C. Osborn, Albany, N. Y...... 5

Turkeys, etc.

Pairs Wild Turkeys.

First prize, E. A. Wendell, Albany, N. Y...... 5

Pairs Bronze Turkeys.

First prize, Joseph Juliand, Bainbridge, N. Y.. 5

Pairs White Turkeys.

First prize, F. D. Curtis, Charlton, N. Y..... 5
Second, F. D. Curtis, Charlton, N. Y......... 3

Pairs Buff Turkeys.

Second prize, O. Howland, Auburn, N. Y...... 3

Pairs Black Turkeys.

First prize, O. Howland, Auburn, N. Y....... 5

Pairs Pearl Guinea Fowls.

First prize, Peter Van Wie, Cedar Hill, N. Y.. 5
Second, Joseph Juliand, Bainbridge, N. Y..... 3

Pairs White Guinea Fowls.

First prize, Peter Van Wie, Cedar Hill, N. Y.. 5

Pairs Pea Fowls.

First prize, Joseph Juliand, Bainbridge, N. Y., 5
Second, Joseph Juliand, Bainbridge, N. Y..... 3

Geese.

Pairs Bremen Geese.

First prize, F. Wood Gray, Quebec, Canada... 5
Second, O. Howland, Auburn, N. Y.......... 3

Pairs White China Geese.

Second prize, Peter Van Wie, Cedar Hill, N. Y., 3

Pairs Brown China Geese.

First Prize, B. C. Trumbell, Elmira, N. Y.... 5

Pairs Wild Geese.

First prize, F. Mather, Honeoye Falls, N. Y... 5

Ducks.

Pairs Rouen Ducks.

First prize, O. Howland, Auburn, N. Y....... 5
Second, W. A. Fuller, Glen, N. Y...... 3

PAIRS AYLESBURY DUCKS.

First prize, C. H. Malleson, Hudson, N. Y.... $5
Second, F. D. Curtis, Charlton, N. Y......... 3

PAIRS CAYUGA DUCKS.

First prize, O. Howland, Auburn, N. Y....... 5
Second, O. Howland, Auburn, N. Y.......... 3

PAIRS TOP-KNOT DUCKS.

First prize, Frank Waterman, Albany, N. Y... 5
Second, Peter Van Wie, Cedar Hill, N. Y..... 3

PAIRS MUSCOVY DUCKS.

First prize, E. A. Wendell, Albany, N. Y..... 5

PAIRS MONGREL DUCKS.

Second prize, E. A. Wendell, Albany, N. Y.... 2

PIGEONS.

PAIRS POUTER PIGEONS.

First prize, E. A. Wendell, Albany, N. Y..... 3

PAIRS CARRIER PIGEONS.

First prize, E. A. Wendell, Albany, N. Y..... 3
Second, Daniel Porter, Albany, N. Y......... 2

PAIRS TUMBLERS.

First prize, E. A. Wendell, Albany, N. Y..... 3

PAIRS BARBS.

First prize, E. A. Wendell, Albany, N. Y...... 3

PAIRS TURBITS (SOLID COLOUR).

First prize, E. A. Wendell, Albany, N. Y..... 3

PAIRS TURBITS (WINGED).

Second prize, E. A. Wendell, Albany, N. Y.... 2

PAIRS FANTAILS.

First prize, E. A. Wendell, Albany, N. Y...... 3

PAIRS JACOBINS.

First prize, E. A. Wendell, Albany, N. Y..... 3

PAIRS DRAGOONS.

First prize, Daniel Porter, Albany, N. Y...... 3
Second, E. A. Wendell, Albany, N. Y......... 2

PAIRS ANTWERPS.

First prize, Daniel Porter, Albany, N. Y 3
Second, E. A. Wendell, Albany, N. Y......... 2

COLLECTIONS OF POUTERS.

First prize, E. A. Wendell, Albany, N. Y..... 5

COLLECTIONS OF CARRIERS.

First prize, E. A. Wendoll, Albany, N. Y..... 5

COLECTIONS OF TUMBLERS.

First prize, E. A. Wendell, Albany, N. Y..... 5

COLLECTIONS FANCY PIGEONS.

First prize, E. A. Wendell, Albany, N. Y..... $5

COLLECTIONS OF TOY PIGEONS.

First prize, E. A. Wendoll, Albany, N. Y..... 5

PAIR RING DOVES.

Extra award, Fred Mather, Honcoye Falls, N.Y., 5

COMMON RABBITS.

BUCKS.

First prize, Thos. Kirkpatrick, Albany, N. Y.. 2
Second, E. A. Wendell, Albany, N. Y........ 1

DOES.

First prize, Thos. Kirkpatrick, Albany, N. Y.. 2
Second, E. A. Wendell, Albany, N. Y........ 1

FISH.

EXHIBITION BROOK TROUT.

First prize, Fred Mather, Honeoye Falls, N. Y., 10

EXHIBITION BLACK BASS.

First prize, Fred Mather, Honeoye Falls, N. Y., 10

EXHIBITION GOLD FISH.

First prize, Fred Mather, Honeoye Falls, N. Y., 3
Second, E. A. Wendell, Albany, N. Y......... 2

FRESH WATER AQUARIUM.

First prize, Fred Mather, Honeoye Falls, N. Y., 3

F. G. WENTWORTH, *New York.*
G. S. MILLER, *Peterboro' N. Y.*

CLASS IV.—IMPLEMENTS AND MACHINERY.

No. 18.—IMPLEMENTS AND MACHINES, FIRST LIST.

STATIONARY STEAM ENGINES.

John E. Sweet, Ithaca, N. Y.; twenty-horse power engine, new design, 3,000 lbs., $1,000 ....Bronze Medal.

Townsend & Jackson, Albany, N. Y.; 14 inch bore, 24 inch stroke, 12,500 lbs., $2,500.. Bronze Medal.

PORTABLE STEAM ENGINES.

Shapely & Wells, Binghamton, N. Y.; portable engine, eight-horse power, 3,000 lbs., $650, Bronze Medal.

D. P. Davis, 46 Cortlandt street, New York city, by H. L. Emery & Sons, agents, Albany, N. Y.; patent farm portable oscillating steam engine, 1,500 lbs., $750........... Certificate of Merit.

A. Kipp, Jr. & Co, Sing Sing, N. Y.; Kipp engine to attach to boiler, two and half-horse power, 2 by 2 feet, $200.......... Certificate of Merit.

Steam Fire Engines, First Class.

Clapp & Jones Manufacturing Co., Hudson, N. Y.; No. 2, steam fire engine; diameter of steam cylinder 11 inches; of water cylinder 6 inches; stroke of steam piston 8 inches; of water piston 8 inches. Boiler, diameter 38 inches; height 53 inches; fire-grate area 3.14-100 sq. ft.; tubes 215, 1¼ inches, 38, 2 nches; least distance between, 7-16 inch; material of tubes, iron; heating surface 206 sq. ft.; weight 5,500 lbs., price $5,000 .... Bronze Medal.

Steam Fire Engines, Second Class.

Clapp & Jones Manufacturing Co., Hudson, N. Y.; No. 4, steam fire engine; diameter of steam cylinder 8 inches; of water cylinder 4⅜ inches; stroke, steam piston 8 inches; water piston 8 inches. Boiler, diameter 32 inches; height 52 inches; fire-grate area 2.13-100 sq. ft.; tubes 157, 1¼ inches, 24, 2 inches, iron; least distance between, ⅜ inch; heating surface 140 sq. ft.; weight 3,700 lbs., price $4,000 .... Bronze Medal.

Extra Awards.

Ploughs.

Ames Plow Co., Boston, Mass.; for Hake's swivel ploughs .... Certificate of Merit.

Ames Plow Co., Boston, Mass.; Hapgood's eccentric swivel plough .... Certificate of Merit.

J. M. Childs & Co., Utica, N. Y.; for valuable improvements ..... Certificate of Highest Merit.

Oneonta Manufacturing Co., Oneonta, N. Y.; Hodge's patent reversible ploughs .... Certificate of Merit.

Starbuck Brothers, Troy, N. Y.; general display of ploughs .... Certificate of Highest Merit.

Harrows.

Albert Kane, Newport, N. Y.; portable harrow .... Certificate of Merit.

Horse Hoes, Cultivators, Etc., for Root and Grain Crops.

Wheeler & Melick Co., Albany, N. Y.; two-horse cultivator .... Certificate of Merit.

Potato Planters.

J. L. True, Benton, Me.; potato planter ...... Certificate of Merit.

Hay Tedders.

C. R. Frink, Norwich, N. Y.; Chenango hay tedder .... Certificate of Merit.

Hay Loading Machine.

American Hay Loading Machine Co., Troy, N. Y.; American hay loader, Douglas' patent, width of ordinary waggon, and attachable thereto .... Certificate of Merit.

Potato Diggers.

L. Augustus Aspinwall, Albany, N. Y.; potato digger .... Certificate of Merit

Miscellaneous.

Ames Plow Co., Boston, Mass.; for display of agricultural implements .... Certificate of Highest Merit.

Remington Agricultural Co., Ilion, N. Y.; Walker & Mairs, agents, Schenectady, N. Y., display of implements .... Certificate of Highest Merit.

Wheeler & Melick Co., Albany, N. Y.; for general display of machines .... Certificate of Highest Merit.

Starbuck Brothers, Troy, N. Y.; ring feed water heater .... Certificate of Merit.

Starbuck Brothers, Troy, N. Y.; high and low water indicator .... Certificate of Merit.

Starbuck Brothers, Troy, N. Y.; lock safety valves .... Certificate of Highest Merit.

No. 19.—Implements and Machines, Second List.

Fanning Mills.

Amos Bryan, Pine Plains, N. Y.; fanning mill for chaffing and screening grain and seed .. Bronze Medal.

Corn Husking Machines.

Isaac Hallenbeck, Schenectady, N. Y.; W. D. Jones' patent .... Bronze Medal.

Feed or Chaff Cutters, Hand and Power.

Rochester Agricultural Works, Rochester, N. Y.; "Empire" power machine .. Bronze Medal.

Corn Shellers, Hand and Power.

Dodge & Stevenson Manufacturing Co., Auburn, N. Y .... Bronze Medal

Ames Plow Co., Boston, Mass.; prairie corn sheller, with balance wheel. Certificate of Merit.

Clover Hullers and Cleaners.

H. L. Emery & Sons, Albany, N. Y.; clover seed grater and cleaner .... Bronze Medal.

Cider Mills.

Cleveland Agricultural Works, Cleveland, O.; American cider mill .... Bronze Medal.

Boomer & Boschert, Syracuse, N. Y .... Certificate of Highest Merit.

Pumps for Farm Use.

L. W. Olds, Erie, Penn.; Van Santvoord and Anable, agents, Albany, N. Y ... Bronze Medal.

T. W. Shaw, West Troy, N. Y. Certificate of Merit.

Washing Machines.

Brinkerhoff Manufacturing Co., Auburn, N. Y.; S. D. Cole, agent, West Troy, N. Y.; the Continental .... Bronze Medal.

W. H. Jones & Co., Mabbettsville, N. Y.; Hubbell's automatic steam washer .... Certificate of Merit.

Clothes Wringers.

Empire Clothes Wringer Co., Auburn, N. Y.; Brinkerhoff's patent clothes wringer .... Bronze Medal.

MACHINES FOR SHARPENING MOWING AND REAPING MACHINE KNIVES.

William H. Field, Port Chester, N. Y.; Curtis' patent........................Bronze Medal.

APPARATUS FOR STEAMING FOOD FOR STOCK.

P. P. Mast & Co., Springfield, O.; Anderson's agricultural steamer...........Bronze Medal.

EXTRA AWARDS.

HAY AND OTHER PRESSES.

P. K. Dederick & Co., Albany, N. Y.; patent perpetual baling press..........Bronze Medal.

P. K. Dederick & Co., Albany, N. Y.; general display of machines. Certificate of Highest Merit.

Dodge Excelsior Press Co., Cohoes, N. Y.; Dodge excelsior hay and cotton press..... Certificate of Highest Merit

COTTON GINS.

H. L. Emery & Sons, Albany, N. Y.; cotton gin, condenser and automatic feeder...... Certificate of Highest Merit.

H. V. Scattergood, Albany, N. Y.; American needle condenser cotton gin.............. Certificate of Highest Merit.

MISCELLANEOUS.

Bradley Manufacturing Co., Syracuse, N. Y.; Bradley cushioned hammer.............. Certificate of Highest Merit.

Capron Water Wheel Manufacturing Co., Hudson, N. Y.; general display of turbine water wheels.............Certificate of Merit.

Edward Carter, Troy, N. Y.; clothes dryer... Certificate of Merit.

P. K. Dederick & Co., Albany, N. Y.; improved horse hoisting machine.................. Certificate of Highest Merit.

P. K. Dederick & Co., Albany, N. Y.; iron-box wheelbarrow, iron dock block, hook block, self-dumping iron coal tubs, dumping coal hand-cart...............Certificate of Merit.

Eldridge and Knower, Albany, N. Y.; American stove plate dressing machine............. Certificate of Highest Merit.

Henry H. Hunt. Saratoga Springs, N. Y.; Hunt's improved endless chain hod elevator ...... Certificate of Merit.

Kinyon Brothers, Raritan, N. J.; power meat chopper..................Certificate of Merit.

P. P. Mast & Co., Springfield, O; Whitman & Burrell, agents, Little Falls, N. Y.; Anderson's patent lard or fat renderer and boiler. Certificate of Merit.

Ira B. Sampson & Co., Albany, N. Y.; cork cutting machine...............Certificate of Merit.

John E. Sweet, Ithaca, N. Y.; machinist's tools for testing angles and surfaces.......... Certificate of Highest Merit.

No. 20.—WOOD WORKING MACHINERY.

PLANING AND MATCHING MACHINES.

Frank & Co., Buffalo, N. Y.; 24-inch pony planer.........................Bronze Medal.

SURFACE PLANING MACHINES.

Daniel Doncaster, Albany, N. Y.....Bronze Medal.

MOULDING MACHINES.

Davis & Gledhill, Albany, N. Y.....Bronze Medal.

Daniel Doncaster, Albany, N. Y.............. Certificate of Highest Merit.

BLIND SLAT PLANERS.

Daniel Doncaster, Albany N. Y.....Bronze Medal.

RESAWING MACHINES.

Davis & Gledhill, Albany, N. Y......Bronze Medal.

Davis & Gledhill, Albany, N. Y.............. Certificate of Highest Merit.

STEAM SCROLL SAWING MACHINES.

Jerome S. Moseley, Syracuse, N. Y.; Eureka patent scroll sawing machine....Bronze Medal.

MISCELLANEOUS.

Edward Carter, Troy, N. Y.; boring machine.. Bronze Medal.

A. B. Corby, Binghamton, N. Y.; machine for pointing fence pickets, flat or square, new patent ....Certificate of Merit.

Davis & Gledhill, Albany, N. Y.; blind stile boring machine (self-feeding)............... Certificate of Highest Merit.

Daniel Doncaster, Albany N. Y.; swing cross cut saw.................Certificate of Merit.

Lane Manufacturing Co., Montpelier, Vt.; Lane's patent double circular board machine...... Bronze Medal.

Monroe & Harrington, Boston, Mass.; patent machine for cutting bungs and taps of all sizes, straight or taper.........Bronze Medal.

Alexander Rickets, Schoharie, C. H., N. Y.; patent hub lathe...............Bronze Medal.

William Scott, Binghamton, N. Y.; hub borer.. Bronze Medal.

Taylor Brothers & Co., Fulton, N. Y.; specimens of knives for planing machines, paper engines, rag rutters, trimming staves, tobacco, etc..............Certificate of Highest Merit.

D. M. GREENE, *Troy, N. Y.*, *Chairman.*

No. 21.—DAIRY IMPLEMENTS.

BUTTER WORKERS.

A. J. Dibble, Franklin, N. Y.; butter worker, salt grinder and salt gauge combined...... Certificate of Highest Merit.

MILK PANS.

First prize, Orange County Milk Pan Co., Franklin, N. Y.; patent milk pans for setting milk and raising cream; one pan holds a milking, four pans and vats in a set....... $3

Second, S. Powers, Smyrna, N. Y.; by H. Blake, Panama, N. Y. $2

BUTTER TUBS AND FIRKINS.

First prize, Milo Harris, Jamestown, N. Y. 5

PAILS AND FIRKINS FOR TRANSPORTING BUTTER IN HOT WEATHER.

First prize, Milo Harris, Jamestown, N. Y. $5

EXTRA AWARDS.

James Paddock, Potsdam Junction, N. Y.; Cowles' patent milk cooler.. Certificate of Merit.

Willard & Hammond, Randolph, N. Y.; Willard & Sawtell's patent milk vat, cooler and cream raiser...... Certificate of Highest Merit.

Milo Harris, Jamestown, N. Y.; return oyster pail.............. Certificate of Highest Merit.

O. S. BLISS, *Georgia, Vt.*
T. D. CURTIS, *Utica, N. Y.*

No. 22.—TOOLS AND HAND IMPLEMENTS FOR THE FARM AND GARDEN.

GRAIN CRADLES.

First prize, R. Morgan, Fayetteville, N. Y.; M. E. Viele, agent.......... $5

Second, E. Paddock, Cairo, N. Y.; M. E. Viele, agent,.......... 3

HAND RAKES, WOODEN.

First prize, J. G. Garfield, Tyringham, Mass.; M. E. Viele, agent.......... 5

GARDEN RAKES.

First prize, Auburn Manufacturing Co., Auburn, N. Y.; Van Santford & Anable, agents.... 5

Second, Tuttle Manufacturing Co., Naugatuck, Conn.; M. E. Viele, agent.......... 3

HAY FORKS.

First prize, Batcheldor & Sons, Wallingford, Vt.; M. E. Viele, agent.......... 5

Second, Auburn Manufacturing Co., Auburn, N. Y.; Van Santvoord & Anable, agents..... 3

MANURE FORKS.

First Prize, Auburn Manufacturing Co.; Auburn, N. Y.; Van Santvoord & Anable, agents... 5

Second, Tuttle Manufacturing Co., Naugatuck, Conn.; M. E. Viele, agent.......... 3

SPADING FORKS.

First prize, Auburn Manufacturing Co., Auburn, N. Y.; Van Santvoord & Anable, agents... 5

Second, Tuttle Manufacturing Co., Naugatuck, Conn.; M. E. Viele, agent.......... 3

GRASS SCYTHES.

First prize, Auburn Manufacturing Co., Auburn, N. Y.; Van Santvoord & Anable, agents... 5

Second, Eagle Manufacturing Co., Riverton, Conn,; M. E. Viele, agent.......... 3

GRAIN SCYTHES.

First prize, Auburn Manufacturing Co., Auburn, N. Y.; Van Santvoord & Anable, agents.. $5

SCYTHE SNATHS.

First prize, Frost, Derby & Co., Bellows Falls, Vt.; M. E. Viele, agent.......... 5

Second, Lamson Goodnow Manufacturing Co., Sherbnrn Falls, Mass.; Van Santvoord & Anable, agents.......... 3

HOES.

Firse prize, Auburn Manufacturing Co,, Auburn N. Y.; Van Santvoord & Anable, agents... 5

Second, Tuttle Manufacturing Co., Naugatuck, Conn.; M. E. Viele, agent.......... 3

POTATO FORKS.

First prize, Auburn Manufacturing Co., Auburn, N. Y.; Van Santvoord & Anable, agents.. 5

POTATO HOOKS.

First prize, Tuttle Manufacturing Co., Naugatuck Conn.; M. E. Viele, agent.......... 5

Second, Auburn Manufacturing Co., Auburn, N. Y.; Van Santvoord & Anable, agents.. 3

AXES.

First prize, Nobles Manufacturing Co., Elmira, N. Y.; Van Santvoord & Anable, agents... 5

Second, Weed, Becker & Co., Cohoes, N. Y.; M. E. Viele, agent.......... 3

EXHIBITION OF EDGE TOOLS.

First prize, Weed, Becker & Co., Cohoes, N. Y.; M. E. Viele, agent.......... 5

Second, Edward Carter, Troy, N. Y.......... 3

EXHIBITION OF SAWS.

First prize, Pruyn & Lansing, Albany, N. Y... 5

Second, Edward Carter, Troy, N. Y.......... 3

EXHIBITION OF FILES.

First prize, Sheffield File Works, Albany, N. Y. Bronze Medal.

EXHIBITION OF FARM AND GARDEN TOOLS AND IMPLEMENTS.

First prize, Van Santvoord & Anable, Albany, N Y.......... $10

ASSORTMENT OF CARPENTER'S AND MECHANICS' TOOLS FOR A FARMER (IN CHEST) QUALITY, COMPLETENESS AND PRICE CONSIDERED.

First prize, George Parr, Buffalo, N. Y.; Van Santvoord & Anable, agents.......... 10

WIRED BROOMS.

First prize, Society of Shakers, Niskayuna, N. Y.; Van Santvoord & Anable, agents.. 3

TWINE TIED BROOMS.

First prize, Society of Shakers, Niskayuna, N. Y.; Van Santvoord & Anable, agents.......... 3

Corn Baskets.

First prize, Williams Manufacturing Co., Northampton, Mass.; Van Santvoord & Anable, agents.............................. $3

Draining Tiles.

First prize, Wm. M. Bender, Albany, N. Y.... 5

Extra Awards.

Fences, Gates, Etc.

C. T. Bush, Binghamton, N. Y.; two panels and gate for patent iron fence...Certificate of Merit.

Joseph E. Stonge, Newton Brook, Canada; Stonge's excelsior farm entrance gate, to be opened from the carriage or loaded waggon.. Certificate of Merit.

Oscar Wilson, Middleburgh, N. Y.; patent wrought iron fence........Certificate of Merit.

John Gibson, Jr., Albany, N. Y.; expanding tree boxes...................Certificate of Merit.

Greenfield Tool Co., Greenfield, Conn.; M. E. Viele, agent, assortment of carpenters' planes............Certificate of Highest Merit.

Miller's Falls Manufacturing Co., Miller's Falls N. Y.; M. E. Viele, agent; Langdon's adjustable mitre box, Barber's patent braces.. Certificate of Merit.

Stanley Rule and Level Co., New Boston, Conn.; M. E. Viele, agent; Bailey's wood planes, Bailey's iron planes.......Certificate of Merit.

Barlow & Walker, Sing Sing, N. Y.; Empire and Monitor lawn mowers.....Certificate of Merit.

W. W. Bryan, Mechanicsville, N. Y.; patent wood tined grain forks.....Certificate of Merit.

No. 23.—Waggons, Carriages, Saddlery and Articles of Wheelwrights' and Blacksmiths' Work.

Coaches.

First prize, James Goold & Co., Albany, N. Y.; for family use......................... $10

Second, Shaible & Butler, Schenectady, N. Y.; high door shutter barouche............. 5

Rockaway, Brett or Chariotee.

First prize, Chamberlin, Son & Co., Troy, N. Y.; chariotee................Silver Medal.

Second, James Goold & Co., Albany, N. Y.... $5

Road Waggons or Phætons.

First prize, Chamberlin, Son & Co., Troy, N. Y.; top buggy..................Silver Medal.

Second, James Kingsbury, Albany, N. Y...... $5

Shaible & Butler, Schenectady, N. Y., cabriolette or Victoria phæton..Certificate of Highest Merit.

Shaw & Rose, Albany, N. Y.; lady's top phæton........ ....Bronze Medal.

Open Buggys.

First prize, Chamberlin, Son & Co., Troy, N. Y.......... ....Silver Medal.

Second, Shaw & Rose, Albany, N. Y.......... $5

Business Waggons.

First prize, Fitzgerald & Kinne, Cortland, N. Y.; family and business waggon, with jacks and single leaf springs...................... $10

Second, Fitzgerald & Kinne, Cortland, N. Y.; family and business waggon, with ordinary wheels............................ 5

Double Sleighs.

First prize, James Goold & Co., Albany, N. Y.; landau sleigh.......................... 10

Second, Lown & Horton, Troy, N. Y.; barouche landau sleigh.......................... 5

Single Sleighs.

First prize, James Goold & Co., Albany, N. Y.. 10

Second, Shaw & Rose, Albany, N. Y.; light Portland............................ 5

Assortments of Waggon Wood Work.

First prize, Haxtun & Griffin, Fort Edward, N. Y................................ 10

Carriage Harness.

First prize, L. J. Lloyd, Albany, N. Y........ 5

Second, L. J. Lloyd, Albany, N. Y........... 3

Single Harness.

First prize, L. J. Lloyd, Albany, N. Y......... 5

Extra Awards.

Fitzgerald & Kinne, Cortland, N. Y.; general display of waggon and wheel work..Bronze Medal.

Shaw & Rose, Albany, N. Y.; general display of carriage work..............Bronze Medal.

A. Benedict, Albany, N. Y.; Benedict's patent neck yoke and pole tip....Certificate of Merit.

Francis E. Boughton, Nassau, N. Y.; platform spring waggon............Certificate of Merit.

E. Caswell, Lyons, N. Y.; Caswell's excelsior box setter, sets the boxes in waggon hubs perfectly true...........Certificate of Merit.

J. M. Jones & Co., West Troy, N. Y.; one-horse car, patent ....Certificate of Merit.

L. J. Lloyd, Albany, N. Y.; blankets, saddles, trunks, bags, etc..Certificate of Highest Merit.

S. N. Brown, Dayton, O.; by Long & Silsby, Albany, N. Y.; trade waggon........... Certificate of Highest Merit.

Miller's Falls Manufacturing Co., Miller's Falls, N. Y.; M. E. Viele, agent, angular drill.. Certificate of Merit.

A. F. Prentice & Co., Worcester, Mass.; M. E. Viele, agent, bolt cutter...Certificate of Merit.

Reed & Boum, Granville, Conn.; M. E Viele, agent, combined iron shear, punch and upset......................Certificate of Merit.

John Tamkins, Conklin Station, N. Y.; market waggon, portable top......Certificate of Merit.

Torsion Spring Co., Erie, Penn.; John Lee, Troy, N. Y., agent; waggon spring, seat spring, pole spring, torsion principle..... Certificate of Highest Merit.

E. J. Worcester, Worcester, Mass.; M. E. Viele, agent, blacksmiths' drills.......... Certificate of Merit.

No. 24.—Castings, Hollow Ware, Etc.

Exhibition of Hollow Ware.

John A. Goewey, Albany, N. Y.....Bronze Medal.
H. R. Remsen, Albany, N. Y........Bronze Medal

Castings.

Daniel Doncaster, Albany, N. Y.; assorted window caps and sills, door caps with pilaster and other specimens of castings..... Bronze Medal

James McKinney, Albany, N. Y.; samples of architectural iron work................. Certificate of Highest Merit.

Portable Forges.

William P. Kellogg & Co., Troy, N. Y.; fan blowing, portable, for smiths' and mechanics' uses, with or without top.......Bronze Medal.

Extra Awards.

William G. Caw, Schenectady, N. Y.; heater and cook stove combination, can be applied to all cook stoves..Certificate of Highest Merit.

John Gibson, Jr., Albany, N. Y.; stove legs.. Certificate of Merit.

John Gibson, Jr., Albany, N. Y.; stove pots, locking covers and side handles.......... Certificate of Merit.

Jagger Iron Co., Albany, N. Y.; three grades of pig iron...................Bronze Medal

Osborn & Martin, Albany, N. Y.; samples of galvanized iron work................... Certificate of Highest Merit.

Palmer, Newton & Co., Albany, N. Y.; fire-brick and stove linings.................. Certificate of Highest Merit.

D. M. Greene, *Troy, N. Y.*, *Chairman.*

Class V.—FARM PRODUCE.

No. 25.—Grains, Seeds, Hops—Grown in 1873.

White Winter Wheat.

Second prize, Harvey & Ai Pine, Pittstown, N. Y................................ $5

Red Spring Wheat.

First prize, Harvey & Ai Pine, Pittstown, N. Y. 10

Note.—*The display of wheat is insignificant, entirely unworthy the great State of New York, both in quantity and quality.*

Rye.

First prize, H. Schoonmaker, Cedar Hill, N. Y., $10
Second, George L. Walker, Bethlehem, N. Y... 5

Note.—*Quality of rye on exhibition good.*

White Oats.

First prize, George Bender, New Scotland, N. Y.; New Brunswick.................... 10

Black or Gray Oats.

Second prize, H. Schoonmaker, Cedar Hill, N. Y.; Norway.......................... $5

Note.—*But three samples of white oats and two of black or mixed exhibited, quality as a whole scarcely commendable.*

Two-rowed Spring Barley.

First prize, A. L. Thomas, Cuba, N. Y....... $10

Note.—*Quality exceedingly fine.*

Yellow Indian Corn.

First prize, Harvey & Ai Pine, Pittstown, N. Y., 10

Field Beans, Large.

First prize, J. Thomas, Cuba, N. Y........... 10
Second, A. L. Thomas, Cuba, N. Y.......... 5

Field Beans, Small.

First prize, L. L. French, Richfield Springs, N. Y.; medium........................ 10

Field Peas, Large.

First prize, L. L. French, Richfield Springs, N. Y.; black-eyed marrowfat............ 10
Second, A. L. Thomas, Cuba, N. Y........... 5

Field Peas, Small.

First prize, J. Thomas, Cuba, N. Y.......... 10

Note.—*The quality of beans and peas was excellent.*

Buckwheat.

First prize, G. W. Bender, New Scotland, N. Y.; Michigan grey.......................... 5
Second, L. L. French, Richfield Springs, N. Y.. 3

Twenty-five Seed Ears Yellow Corn, Eight-rowed.

First prize, Henry Schoonmaker, Cedar Hill, N. Y................................ $5
Second, Harvey and Ai Pine, Pittstown, N. Y.. 3

Twenty-five Seed Ears Yellow Corn, Twelve-rowed.

First prize, Harvey and Ai Pine, Pittstown, N. Y................................ 5
Second, John E. Robinson, Schenectady, N. Y.. 3

Twenty-five Ears Early Sweet Corn.

First prize, G. W. Brower & Son, Schenectady, N. Y................................ 5
Second, Crosman Brothers, Rochester, N. Y... 3

Twenty-five Years Late Sweet Corn.

First prize, Crosman Brothers, Rochester, N. Y. 5
Second, G. W. Brower & Son, Schenectady, N. Y................................ 3

Bales of Hops.

First prize, J. L. Fursman, Schodack Centre, N. Y................................ 10

No. 26.—Vegetables.

Celery.

First prize, Ira Harris, Loudonville, N. Y..... $3
Second, Crosman Brothers, Rochester, N. Y... 2

Cauliflowers.

First prize, Ira Harris, Loudonville, N. Y..... 3
Second, G. W. Brower & Son, Schenectady, N. Y.... 2

Cabbages.

First prize, Andrew Passenger, Schenectady, N. Y.... 3

Lettuce.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y.... 3

Turnips.

First prize, Ira Harris, Loudonville, N. Y..... 3
Second, D. A. Clark, Bethlehem, N. Y.; Golden ball 2

Mangolds and Beets.

First prize, Harris Lewis, Frankfort, N. Y.... 3
Second, M. E. Myers, Charlton, N. Y......... 2

Note.—*The display of mangolds and beets, very fine, while those of Harris Lewis are entitled to more than a passing notice.*

Orange Carrots.

First prize G. W. Brower & Son, Schenectady, N. Y.... $3
Second, Crosman Brothers, Rochester, N. Y.. 2

White Carrots.

First prize, Crosman Brothers, Rochester, N. Y. 3
Second, G. W. Brower & Son, Schenectady, N. Y.... 2

Parsnips.

First prize, Crosman Brothers, Rochester, N. Y 3
Second, G. W. Brower & Son, Schenectady, N. Y.... 2

Salsify.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y.... 3
Second, Crosman Brothers, Rochester, N. Y... 2

Kohl-Rabi.

First prize, Ira Harris, Loudonville, N. Y 3
Second, Andrew Passenger, Schenectady, N.Y.. 2

Onions.

First prize, Crosman Brothers, Rochester, N. Y. 3
Second, Ira Harris, Loudonville, N. Y......... 2

Tomatoes.

First prize, Crosman Brothers, Rochester, N. Y.... $3
Second, G. W. Brower & Son, Schenectady, N. Y.... 2

Egg Plants.

First prize, Crosman Brothers, Rochester, N. Y.... 2
Second, G. W. Brower & Son, Schenectady, N. Y.... 2

Garden Beans.

First prize, Crosman Brothers, Schenectady, N. Y.... 3
Second, Mrs. J. T. Van Namee, Pittstown, N. Y. 2

Peppers.

First prize, Crosman Brothers, Rochester, N. Y.... 3
Second, G. W. Brower & Son, Schenectady, N. Y.... 2

Squashes.

First prize, G. W. Brower & Son, Schenectady, N. Y.... 3
Second, A. McElroy, Loudonville, N. Y.; mammoth Chili.... 2

Pumpkins.

First prize, Harvey and Ai Pine, Pittstown, N. Y.... 3
Second, G. W. Brower & Son, Schenectady, N. Y.... 2

Potatoes, Early Varieties.

First prize, Crosman Brothers, Rochester, N. Y.... 10
Second, B. C. Trumbell, Elmira, N. Y......... 5

Potatoes, Late Varieties.

First prize, Crosman Brothers, Rochester, N. Y.... 10
Second, B. C. Trumbell, Elmira, N. Y......... 5

Potatoes, Stock Feeding Varieties.

First prize, Crosman Brothers, Rochester, N. Y.... 10
Second, B. C. Trumbell, Elmira, N. Y......... 5

General Collections of Potatoes for all Purposes.

First prize, B. C. Trumbell, Elmira, N. Y.; 84 varieties $20
Second, Ira Harris, Loudonville, N. Y......... 10

Collections of Vegetables

First prize, Crosman Brothers, Rochester, N. Y.... 20
Second, G. W. Brower & Son, Schenectady, N. Y.... 10

EXTRA AWARD, SWEET POTATOES.

G. W. Brower & Son, Schenectady, N. Y..... 3

NOTE.—*Two entries by Harris Lewis are seedling potatoes, one an early and the other a late variety, were exceedingly fine, and give much promise as improved varieties.*

Ira Harris made a creditable display of roots, squashes, melons, etc., and not being entered for general collection are entitled to notice.

While many articles were more than ordinary, yet taken as an exhibition at the N. Y. State Fair, the quantity and number of exhibitors were far too small.

No. 27.—FLOUR, ETC.

STARCH FROM CORN.

First prize, Mrs. A. Stone, Stanwix, N. Y.... $5

STARCH FROM WHEAT.

First prize, Mrs. A. Stone, Stanwix, N. Y.... 5

HOMINY.

First prize, Mrs. W. H. Graves, Blossvale, N. Y., 5

FARINA.

First prize, Mrs. C. M. Stone, Blossvale, N. Y., 5

OATMEAL.

First prize, Mrs. W. H. Graves, Blossvale, N. Y., 5

PEARLED BARLEY.

First prize, Mrs. C. M. Stone, Blossvale, N. Y., 5

W A. WARD, *Elmira, N. Y.*
W. D. ROBERTSON, *Argyle, N. Y.*

No. 28.—BUTTER.

THIRTY POUNDS JUNE BUTTER.

First prize, Zerah Rider, Cambridge, N. Y.... 20
Second, Mrs. Jane O'Neil, New Lebanon, N. Y., 15
Third, Edmund Rose, Delhi, N. Y... 10

THIRTY POUNDS OF BUTTER MADE AT ANY TIME.

First prize, Ira Harris, Loudonville, N. Y..... $20
Second, Joseph Sweet, Unadilla, N. Y........ 15
Third, B. G. Morss, Red Falls, N. Y......... 10

FIVE POUNDS OF BUTTER IN ONE POUND ROLLS.

First prize, William V. S. Beekman, Saugerties, N. Y.................................. $10
Second, E. F. Bowditch, Framingham, Mass... 5

No. 29.—CHEESE.

AMERICAN CHEESES—FACTORY OR OTHER, OVER ONE YEAR OLD, NOT LESS THAN FORTY POUNDS WEIGHT.

First prize, John G. Cohoe, Clear Spring Factory, Fredonia, N. Y.................. $20
Second, L. L. Wight, Whitesboro', N. Y...... 15
Third, M. E. Myers, Charlton, N. Y......... 10

AMERICAN CHEESES—FACTORY OR OTHER, LESS THAN ONE YEAR OLD.

First prize, L. L. Wight, Whitesboro', N. Y... $20
Second, William Peck, Manheim, N. Y........ 15
Third, John G. Cohoe, Fredonia, N. Y....... 10

FIVE CHEESES.

First prize, L. L. Wight, Whitesboro', N. Y... 20
Second, Old Fairfield Cheese Factory, Whitman & Burrell, agents, Little Falls, N. Y...... 15
Third, John G. Cohoe, Fredonia, N. Y....... 10

THREE FACTORY-MADE CHEESES.

First prize, L. L. Wight, Whitesboro', N. Y... 15
Second, H. Burrell's Old Salisbury Cheese Factory, Whitman & Burrell, agents, Little Falls, N. Y.......................... 10
Third, Little Valley Cheese Factory, Little Valley, N. Y.......................... 5

THREE CHEESES MADE IN A PRIVATE DAIRY.

First prize, William Peck, Manheim, N. Y.... 15

FIVE IMITATION ENGLISH CHEESES.

First prize, C. P. Root, Butternuts, N. Y..... 10

IMITATION OF STILTON CHEESE.

Second prize, Miss Minerva Pine, Pittstown, N. Y.................................. 5

THREE PREPARED RENNETS.

First prize, Mrs. W. H. Graves, Blossvale, N. Y., 10
Second, Harris Lewis, Frankfort, N. Y........ 5

EXTRA AWARD.

The American Dairy Salt Co., and Onondaga Coarse Salt Association, Syracuse, N. Y.; Robert Greer, Albany, N Y.; agent, display of salt.......Certificate of Highest Merit.

T. D. CURTIS, *Utica, N. Y.*
O. S. BLISS, *Georgia, Vt.*

No. 30.—BREAD, SUGAR, ETC.

Special prizes offered by James N. Platt, Esq. of New York city, for the best loaf of home-made wheaten bread, with full statement in writing, of the way of making and material used.

First prize, Mrs. C. M. Stone, Blossvale, N. Y., $25
Second, Mrs. W. H. Graves, Blossvale, N. Y., 15
Third, Edmund Rose, Delhi, N. Y........... 10

NOTE.—*Your Committee had much difficulty in awarding these premiums. The large number of competitors, and the excellent quality of the bread made the task a difficult one.*

WHEATEN BREAD.

First prize, Mrs. A. Stone, Stanwix, N. Y.... $5
Second, Mrs. W. H. Graves, Blossvale, N. Y.. 3

NOTE—*In this exhibition the competition was very sharp, and the quality excellent.*

RYE BREAD.

First prize, M. E. Myers, Charlton, N. Y...... $5
Second, Mrs. Henry Schermerhorn, Schenectady, N. Y................................ 3

INDIAN, OR RYE AND INDIAN BREAD.

First prize, J. H. Loucks, Jerusalem, N. Y.... 5
Second, Mrs. J. T. Van Namee, Pittstown, N. Y., 3

MAPLE SYRUP.

First prize, Mrs. W. H. Graves, Blossvale, N. Y., $5
Second, A. L. Thomas, Cuba, N. Y........... 3

PRESERVED FRESH FRUITS.

First prize, Mrs. Hamilton Hunt, Albany, N. Y., 5
Second, Jennie Schoonmaker, Cedar Hill, N. Y., 3

NOTE.—*Mrs. E. Waddell, of Columbus, Miss., exhibited specimens of preserved fresh citron, quality excellent.*

PICKLES IN VINEGAR.

Second prize, Jennie Schoonmaker, Cedar Hill, N. Y.................................. $3

DRIED APPLES.

First prize, Miss Minerva Pine, Pittstown, N. Y., 5
Second, Mrs. Jacob W. Lewis, Schodack Centre, N. Y............................... 3

DRIED WHORTLEBERRIES.

First prize, Mrs. C. M. Stone, Blossvale, N. Y., 5

DRIED RASPBERRIES.

First prize, J. Thomas, Cuba, N. Y.......... 5
Second, Mrs. W. H. Graves, Blossvale, N. Y., 3

BOX HONEY BY ONE COLONY THIS SEASON.

First prize, Jacob H. Nellis, Canajoharie, N. Y.; by Italian bees...................... 20
Second, J. E. Hetherington, Cherry Valley, N. Y................................ 10

EXTRACTED HONEY BY ONE COLONY THIS SEASON.

First prize, J. H. Hadsell, Breesport, N. Y.... $20

TEN POUNDS OF BOX HONEY.

First prize, Peter Miller, Fredonia, N. Y...... 5
Second, M. H. Tennant, Stanwix, N. Y....... 3

FIVE POUNDS EXTRACTED, OR STRAINED HONEY.

First prize, C. C. Van Deusen, Sprout Brook N. Y.. 5
Second, J. H. Nellis, Canajoharie, N. Y.; from Italian bees.......................... 3

NOTE.—*The Bee Feeder, exhibited by C. C. Van Deusen, Sprout Brook, N. Y., attracted much attention. Its simplicity speaks favourably for it.*

WM. A. WARD, *Elmira, N. Y.*
W. D. ROBBERTSON, *Argyle, N. Y.*

No. 31.—DOMESTIC WINES, ETC.

ISABELLA WINES.

Christian Hauser, Rochester, N. Y.; 1872.... Silver Medal.

CATAWBA WINE, STILL.

Christian Hauser, Rochester, N. Y.; 1872.... Silver Medal.

CATAWBA WINE, SPARKLING.

Christian Hauser, Rochester, N. Y.; 1873.... Silver Medal.

OTHER WINES OF NATIVE GRAPES.

Christian Hauser, Rochester, N. Y.; Delaware, 1872.........................Silver Medal.

CIDER OF LAST YEAR IN BOTTLE.

First prize, Harvey & Ai Pine, Pittstown, N. Y., $5

CIDER VINEGAR.

First prize, Harris Lewis, Frankfort, N. Y.... 5
Second, G. H. Brower & Son, Schenectady, N.Y., 3

EXTRA AWARD.

Jennie Schoonmaker, Cedar Hill, N. Y.; currant wine....................Certificate of Merit.

LEWIS F. ALLEN, *Buffalo, N. Y.*
JOHN A. KING, *Great Neck, N. Y.*

No. 32.—DOMESTIC MANUFACTURES.

PAIRS WOOLLEN BLANKETS.

First prize, Harriet Brownell, Berne, N. Y..... $5

ALL WOOL HORSE BLANKETS.

Second prize, Mrs. C. M. Stone, Blossvale, N. Y 3

TEN YARDS WOOLLEN FLANNEL.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y................................ 5
Second, Mrs. C. M. Stone, Blossvale, N. Y.... 3

TEN YARDS FLANNEL, COTTON WARP.

First prize, Mrs. A. Stone, Stanwix, N. Y..... 5
Second, Mrs. J. T. Van Namee, Pittstown, N. Y................................ 3

TEN YARDS COTTON AND WOOL KERSEY.

First prize Harriet Brownell, Berne N. Y..... 5
Second, Mrs. W. H. Graves, Blossvale, N. Y.. 3

TEN YARDS RAG CARPET.

First prize, Caroline Brownell, Berne, N. Y... 5
Second, J. H. Loucks, Jerusalem, N. Y........ 3

TEN YARDS LINEN CLOTH.

First prize, Mrs. W. H. Graves, Blossvale, N. Y. 5
Second, Harriet Brownell, Berne, N. Y........ 3

TEN YARDS LINEN DIAPER.

First prize, Harriet Brownell, Berne, N. Y.... 5
Second, Caroline Brownell, Berne, N. Y....... 3

TEN YARDS LINEN KERSEY.

First prize, Harriet Brownell, Berne, N. Y.... 5

TEN YARDS TOW CLOTH.

First prize, Mrs. C. M. Stone, Blossvale, N. Y.. 5
Second, Mrs. J. T. Van Namee. Pittstown, N. Y................................ 3

TEN YARDS LINEN BAGGING.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y................................ 5

Knit Bed Spreads.

First prize, Caroline Brownell, Berne, N. Y.... $3
Second, Mrs. Dewey Brimmer, Albany, N. Y.. 2

White Worked or Quilted Bed Spreads.

First prize, Mrs. Sainsburg, Cohoes, N. Y..... 3
Second, Mrs. Jacob W. Lewis, Schodack Centre N. Y.................................... 2

Balmoral Petticoats.

First prize, Mrs. C. M. Stone, Blossvale, N. Y.. 3
Second, Mrs. W. H. Graves, Blossvale, N. Y... 2

Woollen Knit Stockings.

First prize, Caroline Brownell, Berne, N. Y.... 3
Second, Caroline Brownell, Berne, N. Y....... 2

Woollen Knit Mittens.

First prize, Mrs. A. Stone, Stanwix, N. Y..... 3
Second, Caroline Brownell, Berne, N. Y....... 2

Woollen Fringe Mittens.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y.................................... 3
Second, Mrs. W. H. Graves, Blossvale, N. Y. . 2

Linen or Cotton Knit Stockings.

First prize, Mrs. A. Stone, Stanwix, N. Y...... 3

Linen Sewing Thread.

First prize, J. H. Loucks, Jerusalem, N. Y.... 3

Extra Awards.

Mrs. T. Lippett, Albany, N. Y.; silk quilt..... 3
Rhoda Packard, Albany, N. Y.; feather wreath.. 3
Miss C. Paddock, Albany, N. Y.; vase of wax flowers.................................... 5
Jane A. Shaver, Albany, N. Y.; hair wreath... 3
Mrs. R. A. Swan, Knox, N. Y.; feather wreath.. 2
Miss Mary Fazakerly, Albany, N. Y.; wax flowers.................................... 3

James W. Mairs, *Schenectady, N. Y.*
F. G. Wentworth, *New York City.*

Class VI.—FLOWERS AND FRUITS.

No. 33.—Professional List.

Exhibition of Cut Flowers.

First prize, James Vick, Rochester, N. Y..... $10
Second, Briggs Brothers, Rochester, N. Y..... 5

Collection of Dahlias.

First prize, James Vick, Rochester, N. Y...... 6
Second, Crosman Brothers, Rochester, N. Y.. 3

Twenty-four Dahlias.

First prize, James Vick, Rochester, N. Y...... 5
Second, Crosman Brothers, Rochester, N. Y.. 3

Twelve Dahlias.

First prize, James Vick, Rochester, N. Y...... $3
Second, Crosman Brothers, Rochester, N. Y.. 1

American Seedling Dahlias.

First prize, James Vick, Rochester, N. Y...... 1

Exhibition of Roses.

First prize, Ellwanger & Barry, Rochester, N. Y., 6
Second, John Charlton, Rochester, N. Y...... 3

Twenty-four Roses.

First prize, Ellwanger & Barry, Rochester, N. Y., 5

Twelve Roses.

First prize, Ellwanger & Barry, Rochester, N. Y., 3

Exhibition of Phloxes.

First prize, James Vick, Rochester, N. Y...... 5
Second, Briggs Brothers, Rochester, N. Y..... 3

Twelve Phloxes.

First prize, James Vick, Rochester, N. Y...... 3

Exhibition of Verbenas.

First prize, Briggs Brothers, Rochester, N. Y.. 5

Twelve Verbenas.

First prize, Briggs Brothers, Rochester, N. Y.. 3

Three American Seedling Verbenas.

First prize, Ellwanger & Barry, Rochester, N. Y., 1

Exhibition of German Asters.

First prize, Briggs Brothers, Rochester, N. Y.. 3
Second, James Vick, Rochester, N. Y........ 1

Exhibition of Pansies.

First prize, James Vick, Rochester, N. Y..... 3
Second, Briggs Brothers, Rochester, N. Y..... 1

Ten Week Stocks.

First prize, Briggs Brothers, Rochester, N. Y.. 3
Second, James Vick, Rochester, N. Y........ 1

Exhibition of Gladiolus.

First prize, James Vick, Rochester, N. Y...... 3
Second, Briggs Brothers, Rochester, N. Y..... 1

No. 34.—Amateur List.

Exhibition of Cut Flowers.

First prize, N. Hallock, Queens, N. Y........ 10
Second, Mrs. J. T. Van Namee, Pittstown, N. Y.................................... 5

Exhibition of Dahlias.

First prize, N. Hallock, Queens, N. Y........ 6
Second, Mrs. J. Clement, Mechanicsville, N. Y., 3

TWELVE DAHLIAS.

First prize, N. Hallock, Queens, N. Y........ $3
Second, Mrs. J. Clement, Mechanicsville, N. Y., 1

SIX DAHLIAS.

First prize, Mrs. J. Clement, Mechanicsville, N. Y........ 2
Second, N. Hallock, Queens, N. Y........ 1

EXHIBITION OF ROSES.

First prize, N. Hallock, Queens, N. Y........ 6
Second, Mrs. J. T. Van Namee, Pittstown, N. Y........ 3

SIX ROSES.

First prize, N. Hallock, Queens, N. Y........ 2
Second, Mrs. J T. Van Namee, Pittstown, N. Y........ 1

EXHIBITION OF CARNATIONS.

First prize, N. Hallock, Queens, N. Y........ 3

EXHIBITION OF VERBENAS.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y........ 5
Second, Mrs. J. Clement, Mechanicsville, N. Y., 3

TWELVE VERBENAS.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y........ 3

SIX VERBENAS.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y........ 2

SEEDLING VERBENAS.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y........ 1

EXHIBITION OF PHLOXES.

First prize, Mrs. A. Stone, Stanwix, N. Y..... 5

SIX PHLOXES.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y........ 2

NEW SEEDLING PHLOXES.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y........ 1

GERMAN ASTERS.

First prize, Mrs. A. Stone, Stanwix, N. Y.... 3
Second, Mrs. J. T. Van Namee, Pittstown, N. Y........ 1

EXHIBITION OF PANSIES.

First prize, Mrs. A. Stone, Stanwix, N. Y..... 3
Second, Mrs. J. T. Van Namee, Pittstown, N. Y........ 1

TEN WEEK STOCKS.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y........ 3

EXHIBITION OF GLADIOLUS.

First prize, N. Hallock, Queens, N. Y........ 3

EXHIBITION OF EVERLASTING FLOWERS.

First prize, Mrs. J. T. Van Namee, Pittstown, N. Y........ 3

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NIGHT BLOOMING CEREUS.

Mrs. Jacob W. Lewis, Schodack Centre, N. Y., $3

BALSAMS.

Mrs. J. Clement, Mechanicsville, N. Y........ 3

No. 35.—GENERAL LIST—OPEN TO ALL COMPETITORS.

POT PLANTS.

First prize, L. Menand, Albany, N. Y........ 10

TEN PLANTS IN POTS.

First prize, L. Menand, Albany, N. Y........ 5

SPECIAL FLORAL PRIZES.

Offered by James Vick, of Rochester, N. Y.; the flowers to have been grown from seeds that have been purchased of him.

CUT FLOWERS.

N. Hallock, Queens, N. Y........ $20

PHLOX DRUMMONDII.

Mrs. A. Stone, Stanwix, N. Y........ 10

ASTERS.

Mrs. A. Stone, Stanwix, N. Y........ 10

BALSAMS.

N. Hallock, Queens, N. Y........ 10

DIANTHUS FAMILY.

Mrs. J. T. Van Namee, Pittstown, N. Y...... 10

PANSIES.

Mrs A. Stone, Stanwix, N. Y........ 10

STOCKS.

Mrs. J. T. Van Namee, Pittstown, N. Y...... 10

EVERLASTING FLOWERS.

Mrs. J. T. Van Namee, Pittstown, N. Y...... 10

JAS. O'BRIEN, *Jamaica Plains, Mass.*
C. L. ALLEN, *Queens, N. Y.*

No. 36.—FRUITS—PROFESSIONAL LIST.

FORTY VARIETIES OF APPLES.

First prize, Ellwanger & Barry, Rochester, N. Y. 15

TWENTY VARIETIES OF PEARS.

First prize, Ellwanger & Barry, Rochester, N. Y. 15

FIFTEEN VARIETIES OF PEARS.

First prize, Ellwanger & Barry, Rochester, N. Y. 10

TEN VARIETIES OF PEARS.

First prize, Ellwanger & Barry, Rochester, N. Y. 8

TWELVE APPLE OR ORANGE QUINCES.

First prize, Ellwanger & Barry, Rochester, N. Y. 3

NATIVE GRAPES.

First prize, Ellwanger & Barry, Rochester, N. Y. 6

FOREIGN GRAPES, ONE VARIETY.

First prize, Dean Sage, Albany, N. Y........ 2

No. 37.—AMATEUR LIST.

TWENTY VARIETIES OF APPLES.

First prize, D. K. Bell, West Brighton, N. Y.. 12
Second, John M. Wilcox, Three Mile Bay, N. Y. 8

FIFTEEN VARIETIES OF APPLES.

First prize, D. K. Bell, West Brighton, N. Y.. $10
Second, John M. Wilcox, Three Mile Bay, N. Y. 5

TEN VARIETIES OF APPLES.

First prize, D. K. Bell, West Brighton, N. Y.. 5
Second, John M. Wilcox, Three Mile Bay, N. Y.. 3

FIFTEEN VARIETIES OF PEARS.

First prize, D. K. Bell, West Brighton, N. Y.. 12

TEN VARIETIES OF PEARS.

First prize, D. K. Bell, West Brighton, N. Y.. 10
Second, Philip Snyder, Vineland, N. J........ 5

SIX VARIETIES OF PEARS.

First prize, D. K. Bell, West Brighton, N. Y.. 8
Second, George W. Bender, Albany, N. Y..... 4

ONE VARIETY OF PEACHES.

First prize, Philip Snyder, Vineland, N. J..... 2

TEN VARIETIES OF PLUMS.

First prize, J. H. Loucks, Jerusalem, N. Y.... 5

SIX VARIETIES OF PLUMS.

First prize, J. H. Loucks, Jerusalem, N. Y.... 3

ONE VARIETY OF PLUMS.

First prize, Liberty Gilbert, Troy, N. Y....... 2

QUINCES.

Philip Snyder, Vineland, N. J............... 3
Second, D. K. Bell, West Brighton, N. Y..... 2

ONE VARIETY OF NATIVE GRAPES.

First prize, Philip Snyder, Vineland, N. J..... 2
Second, O. L. Jolly, Coeymans, N. Y........ 1

EXHIBITION OF FOREIGN GRAPES.

First prize, Charles W. Little, Albany, N. Y... 6

ONE VARIETY OF FOREIGN GRAPES.

First prize, Charles W. Little, Albany N. Y... 2

SPECIMEN WATERMELON.

Ira Harris, Loudonville, N. Y................ 1

EXTRA AWARDS.

DUCHESSE D'ANGOULÊME PEARS.

Philip Snyder, Vineland, N. J............... 6

SEEDLING GRAPES—EIGHT VARIETIES.

J. H. Rickets, Newburgh, N. Y............. 5

DELAWARE GRAPES.

John Griffin, Albany, N. Y................ 1

CITRONS.

Wm. Ireland, Newtonville, N. Y............ 1

PRUNES.

Liberty Gilbert, Troy, N. Y................. $2

EXHIBITION FLORIDA FRUITS.

A. J. Curtis, Florida....................... 5

CHARLES DOWNING, *Newburgh, N. Y.*
AUSTIN W. WHEELOCK, *Moscow, N. Y.*

CLASS VII.—MISCELLANEOUS.

ARTISTIC.

Annesly & Vint, Albany, N. Y.; looking glasses, Rodgers' groups, pictures and frames, artists' materials, etc............Silver Medal

E. F. Bennett, Troy, N. Y.; ornamental hair work............Certificate of Highest Merit

A. T. Brown & Son, Albany, N. Y.; fancy signs Certificate of Merit

L. H. Burdick, Albany, N. Y.; specimens of printing and blankbooks. Certificate of Highest Merit.

H. G. Eastman, Poughkeepsie, N. Y.; specimens of ornamental penmanship, pen drawing and business penmanship................ Certificate of Highest Merit

E. G. Folsom, Albany, N. Y.; specimens of ornamental and practical penmanship......... Certificate of Highest Merit.

Henry Fuss, Albany, N. Y.; books, book-binding and fancy printing..Certificate of Highest Merit.

Mrs. J. P. Henry, Albany, N. Y.; ornamental hair work........Certificate of Highest Merit.

Ira Porter, Albany, N. Y.; imitation of woods and marbles, and specimens of sign work.. Certificate of Highest Merit

William Prescott, Albany, N. Y.; collection of signs, etc.........Certificate of Highest Merit.

Julius E. Theisen, Albany, N. Y.; ornamental hair work and hair jewellery............ Certificate of Highest Merit.

Troy Business College, Troy, N. Y.; specimens of business penmanship................. Certificate of Highest Merit.

Mrs. A. F. Waldbillig, Albany, N. Y; ornamental hair work.........Certificate of Merit

Wendell & Roberts, Albany, N. Y., bronzes, fancy goods and fancy clocks..........Silver Medal

MECHANICAL AND SCIENTIFIC, MODELS, ETC.

D. J. Brougher, New York; by W. A. Winne, agent, Albany, N. Y.; patent jigsaw worked by hand.................Certificate of Merit.

Derby Brothers, Albany, N. Y.; model beam engine......................Bronze Medal

John Gibson, Jr., Albany, N. Y.; improved Railroad screw spike..........Certificate of Merit.

Harris Brothers, Newport, N. Y.; model of combined feed box and manger. Certificate of Merit.

Hill Brothers, Albany, N. Y.; specimens of printing with press in operation. Certificate of Merit.

Thomas McGrath, Albany, N. Y.; patent side-sticks and quoins for locking newspaper forms, etc........Certificate of Highest Merit.

A. & B. Newberry, Coxsackie, N. Y.; Eureka job printing press.........Certificate of Merit.

Newton & Titus, Gloversville, N. Y.; set of glove cutting machines and cutting block....... Bronze Medal.

J. S. Tilley, West Troy, N. Y.; adjustable scaffold....................Certificate of Merit.

SEWING AND KNITTING MACHINES.

Bickford Knitting Machine Co., N. Y.; by George W. Vining, agent, Albany, N. Y.; four Bickford machines for different classes of work.. Certificate of Highest Merit.

George B. Near, Albany, N. Y.; model sewing machine, with Sargeant & Co.'s castors attached...........Certificate of Highest Merit.

Wheeler & Wilson Manufacturing Co., New York N. Y.; by O. Smith, agent, Albany, N. Y.; adaptation of steam power to sewing machines...........Certificate of Highest Merit.

GAS MACHINES.

Beecher & Worden, agents, Syracuse, N. Y.; Star gas machine......Certificate of Highest Merit.

Underground Gas Machine Co., Portlandville, N. Y.; J. M. Low, agent; underground gas machine.... .....Certificate of Highest Merit.

D. W. Seeley, Cedar Hill, N. Y.; Stevens' patent hydro-carbon gas generator. Certificate of Merit.

MUSICAL.

William Kilbourn, Albany, N. Y.; bass and snare drums......Certificate of Highest Merit.

Thomas S. Lloyd, Albany, N. Y.; violins.... Silver Medal.

FURNITURE.

R. Barringer, North Greenbush, N. Y.; rustic window shades...........Certificate of Merit.

J. C. Butler & Co., Albany, N. Y.; furniture.. Certificate of Merit.

H. W. Collender, New York, N. Y.; rosewood bevel carom billard table, inlaid with California woods........Certificate of Highest Merit.

James Cooley, Albany, N. Y.; Cooley's patent school desk.......Certificate of Highest Merit.

A. E. Cooper, Cooper's Plains, N. Y.; balcony imperial swing, double and Newark rocking chairs, arm chairs and bar room chairs.... Certificate of Highest Merit.

Joseph Crook, Albany, N. Y.; inlaid tool chest.. Silver Medal.

Thomas Elkins, Albany N. Y.; combination table Certificate of Merit.

Erie Chair Co., Erie, Pa; by Davis, Gloeckner & Co., agents., Albany, N. Y.; Herrick's patent nursery chair.........Certificate of Merit.

John Pladwell, Albany, N. Y.; mirror frames.. Certificate of Highest Merit.

Edward M. Harris, New York, N. Y.; per Van Santvoord & Anable, agents, Albany, N. Y.; gem combination drawer and cupboard lock.............Certificate of Highest Merit.

A. & E. C. Koonz, Albany, N. Y.; carpets, oil cloths, matting and rugs............... Certificate of Highest Merit.

H. McKeon, Albany, N. Y.; marble mantle, heavy panelled French pattern....Certificate of Merit.

B. F. Moseley & Son, Albany, N. Y.; carpets and oil cloths.............Certificate of Merit.

John G. Myers, Albany, N. Y.; decorative upholstery and manufactured passementerie.. Certificate of Highest Merit.

J. H. & C. W. Northrup, Utica, N. Y.; easy spring bed........Certificate of Highest Merit.

John R. Robertson, Syracuse, N. Y.; plant stands..................Certificate of Merit.

Robinson & Harris, Albany, N. Y.; Young America combined ironing table and shirt board. Certificate of Merit.

Senrick Brothers, Albany, N. Y.; set of parlour furniture.....Certificate of Highest Merit.

J. P. Sinclair, Elbridge, N. Y.; samples of chairs Certificate of Merit.

Taylor & Waterman, Albany, N. Y.; carpets, rugs, mattings, and oil cloth.....Silver Medal.

Wm. L. Thompson, Albany, N. Y.; pin cushion shape of bureau and ram's head mounted.. Certificate of Highest Merit.

Van Gaasbeek & Co., Albany, N. Y.; carpets and oil cloths.........Certificate of Highest Merit.

H. R. Watson, Albany, N. Y.; spring underbed mattress.........Certificate of Highest Merit.

B. W. Wooster, Albany, N. Y.; furniture..... Silver Medal.

FURNISHING GOODS.

Fonda & Bagley, Albany, N. Y., Winchell's patent oil cans....Certificate of Highest Merit.

John Gibson, Jr., Albany, N. Y., tilting crockery pitchers..............Certificate of Merit.

John Gibson, Jr., Albany, N. Y.; safety tea kettles.................Certificate of Merit.

Milo Harris, Jamestown, N. Y.; model of fruit jars.............Certificate of Highest Merit.

William R. McNally, Abany, N. Y.; rustic and ornamental work..Certificate of Highest Merit.

A. M. Michael, Albany, N. Y.; combination linen marker.............Certificate of Merit.

S. & P. Templeton, Albany, N. Y.; wooden ware, house furnishing goods, etc........ Certificate of Merit.

Tucker & Crawford, Albany, N. Y.; crockery and glass ware....Certificate of Highest Merit.

A. Van Allen, Jr., Albany, N. Y.; exhibition of wire goods......Certificate of Highest Merit.

Van Heusen, Charles & Co., Albany, N. Y.; crockery, glass ware, etc................ Certificate of Highest Merit.

Charles Wallman, Syracuse, N. Y.; bird cages............Certificate of Highest Merit.

Wands & Purdy, Albany, N. Y.; plain and ornamental wire work, coal and sand screens, etc................Certificate of Highest Merit.

P. H. Wemple, Albany, N. Y.; exhibition of sash, blinds, doors, newel posts, rails, balusters and ornamental wood work for buildings.........Certificate of Highest Merit.

M. V. B. White, Albany, N. Y.; sash lock and weather strip combined, and rowing machine, Certificate of Merit.

CLOTHING.

Bullock & Co., Albany, N. Y.; hats, caps, furs, etc..............Certificate of Highest Merit.

Busley, Leonard & Co., Albany, N. Y.; boots and shoes........Certificate of Highest Merit.

Craft, Wilson & Co., Albany, N. Y.; clothing in process of manufacturing............. Certificate of Highest Merit.

Joseph Fearey & Son, Albany, N. Y.; case of shoes ....Certificate of Merit.

C. H. Gardiner, Albany, N. Y.; dress shirts, collars and cuffs........................ Certificate of Highest Merit.

Industrial School, Albany, N. Y.; by Sisters of Charity, infants' embroidered robe...... Silver Medal.

K. V. R. Lansingh, Albany, N. Y.; men's furnishing goods.....Certificate of Highest Merit.

B. Lodge, Albany, N. Y.; children's clothing.. Certificate of Highest Merit.

F. Martineau, Albany, N. Y; kid gloves..... Certificate of Highest Merit.

S. Munson & Co., Albany, N. Y.; exhibition of boots and shoes................Silver Medal.

Pine, Miller & Dunham, Troy, N. Y.; linen collars, cuffs and shirt fronts............ Certificate of Merit.

Putnam, Reese & Co., Albany, N. Y.; hats.... Silver Medal.

J. S. Robbins & Son, Albany, N. Y.; hats, caps, furs, trunks, etc...Certificate of Highest Merit.

M. B. Sherman, Albany, N. Y.; boots and shoes.........................Silver Medal.

William M. Whitney & Co., Albany, N. Y.; millinery goods, ladies' suits and cloaks, carpets and upholstery goods.....Silver Medal.

G. A. Wolverton & Co., Albany, N. Y.; boots and shoes........Certificate of Highest Merit.

GROCERIES.

Bacon, Stickney & Co., Albany, N. Y.; for general display of coffee and spices........ Certificate of Highest Merit.

John B. Cleminshaw, Albany, N. Y.; self-raising flour.........Certificate of Highest Merit.

Judson, Parsons & Haskell, Albany, N. Y.; for Premium Mills baking powder...Silver Medal.

Judson, Parsons & Haskell, Albany, N. Y.; combination spice can................. Certificate of Highest Merit.

E. J. Larrabee & Co., Albany, N. Y.; fancy crackers and biscuits, English and American styles........................Silver Medal.

Benjamin Payn, Albany, N. Y.; snuff and cigars...........Certificate of Highest Merit.

MANUFACTURES.

Albany Paper Box Co., Albany, N. Y.; exhibition of paper boxes for various purposes, Certificate of Merit.

Charles Furley, Albany, N. Y.; institute pamphlet cases........Certificate of Highest Merit.

James Kelly, Albany, N. Y.; silver plating.... Certificate of Merit.

Nelson & Co., N. Y., Black Lead Works, New York city,; specimens of natural and prepared Ceylon plumbago, also patent plumbago paint and gem stove polish..Silver Medal.

Niver Polishing Fluid Co., Niverville, N. Y.; Niver polishing fluid.......Certificate of Merit.

Remington Manufacturing Co., Ilion, N. Y.; by Russell Crego & Son, agents, Albany, N. Y.; guns and rifles..................Silver Medal.

L. G. Rose, Albany, N. Y.; Asbestos roofing and materials.....Certificate of Highest Merit.

T. J. Sullivan, Albany, N. Y.; safes, Davidson pattern...........Certificate of Highest Merit.

E. H. Tallmadge & Co., New York; M. J. Severence, agent, Albany, N Y.; samples of essential oils.............Certificate of Merit.

Clinton Ten Eyck, Albany, N. Y.; family and erasive soaps......Certificate of Highest Merit.

Woodward & Hill, Albany, N. Y.; saddlery, carriage goods, etc..Certificate of Highest Merit.

Phoenix Paper Co., Greenwich, N. Y.; exhibition of wrapping paper..Certificate of Highest Merit.

Rool Wrapping Paper Co., wrapping papers.... Silver Medal.

H. R. Watson, Albany, N. Y.; wall screens... Certificate of Merit.

C. Fasoldt, Albany, N. Y.; tower clock...... Silver Medal.

American Shelving Co., New York City, by Joseph Gavit, agent, Albany, N. Y.; American shelving..........Certificate of Highest Merit.

Miss M. A. Reynolds, Newport, N. Y.; diagrams for cutting ladies and children dresses, Certificate of Merit.

ANSON A. SWEET, *Syracuse, N. Y.*
J. M. WILLIAMS, *Salem, N. Y.*

Jan. 17

THE JOURNAL

OF

The New-York State Agricultural Society.

VOL. XXIII.] ALBANY, NOV. AND DEC., 1873. [NOS. 11 & 12.

State Agricultural Rooms.

The Office of the Society is in the Agricultural Hall, corner of State and Lodge streets, Albany; and all communications on business of the Society should be so addressed.

ANNUAL MEETING.

Pursuant to amendment of the Constitution adopted at the Annual Meeting of 1872, the Annual Meeting will hereafter be held on the Wednesday succeeding the third Tuesday of January in each year, at the city of Albany.

New-York State Agricultural Society.

ANNUAL MEETING.

JANUARY 21, 1874.

The annual meeting and election will be held at Albany on Wednesday, the 21st day of January, 1874, at noon.

At the evening meeting an address will be delivered by the Hon. Andrew D. White, LL. D., President of Cornell University, on Agricultural, Mechanical and General Education in the United States.

Franklin B. Hough, M. D., of Lowville, N. Y., will present a paper on the Necessity of Preserving and **Planting Forests.**

It is expected that the Memorial of ex-President Thomas Hall Faile, by ex-President Conger, will be presented to the Society at this meeting.

In the absence, likely to be more or less protracted, of the Chairman, and in view of the short notice that could be given, the other members of the Committee to which was referred the subject of the proposed convention of the working officers of the Agricultural Societies of the State, have decided not to call such convention at this time. Correspondence on the subject, with the view of ascertaining whether it is largely, or generally, desired that such a convention shall be held at a future time, and whether useful results may be expected from it, is solicited.

STATE FAIR AT ALBANY—ADDITIONAL AWARDS.

Volckert P. Douw, Albany, N. Y., display of agricultural implements, tools, iron-work, etc., Silver Medal.

The Society of Shakers, Mt. Lebanon, N. Y., fancy straw-work, Silver Medal.

EXECUTIVE MEETING.

December 12, 1873.—Present, the President; Vice-Presidents Thorne, Doncaster, Geddes; the Corresponding Secretary; the Treasurer; Messrs. Tucker and Manley, of the Executive Committee, and Ex-President Campbell.

Letters and excuses for non-attendance were received from Vice-Presidents Wing, Curtis and Wadsworth; the Recording Secretary; Messrs. Lewis, Juliand and Cocks, of the Executive Committee, and Ex-President Church.

The awards of medals by the judges in the miscellaneous department, to Volckert P. Douw, for display of agricultural implements and rustic goods, and to the Society of Shakers, at Lebanon, N. Y., for fancy straw-work, were confirmed.

On presentation by the Secretary, of correspondence with Mr. Holmes, of the Executive Committee, and Ex-President Ingalsbe, and also with several officers of county and other agricultural societies in the State, on the subject of holding, at the time of the society's annual meeting, a convention of the working officers of the agricultural societies in the State, and neither Mr. Holmes nor Mr. Ingalsbe being present, it was

Ordered, That the subject of holding a convention of the officers of the agricultural societies in the State of New York, at the time of the approaching annual meeting of the State Agricultural Society, for the consideration of the management of fairs, and of such other questions as may be deemed proper, affecting the operations of such societies, be referred to Mr. Holmes, Ex-President Ingalsbe, Mr. Tucker and the Secretary, with power to issue a call for such convention if they shall deem it expedient.

The President laid before the committee a letter from the Hon Andrew D. White, President of Cornell University, accepting the Committee's invitation to deliver **an address before the Society at the Annual Meeting,**

and announcing as his subject, "Agricultural, Mechanical and General Education in the United States."

On motion, the Secretary was directed to invite Dr. Franklin B. Hough to read a paper on Forestry at the same meeting.

On motion of Mr. Tucker, it was

Ordered, That the Finance Committee consider and report to a meeting of the Executive Committee, to be held on the 20th day of January next, whether it be expedient and proper for the Society to extend aid from its funds to the Albany Agricultural and Arts Association, and if so, to what extent and in what manner.

Adjourned to Tuesday, January 20, 1874, at 4 P. M., unless sooner convened by the President.

VETERINARY REPORT—FAIR OF 1873.

By James Law, M. R. V. C., Professor of Veterinary Science in Cornell University, and Consulting Veterinarian of the society.

As veterinary officer, I would respectfully submit the following report:

The live stock, in general, came on the gro[illegible] excellent condition, and their health throug[illegible] good. The principal ailments were diarrhœas an[illegible] catarrhs, a few cases of each, the result of exp[illegible] and excitement of travel and the change of food [illegible] water. These were shown in cattle, sheep and swine, and readily yielded to appropriate treatment.

The death of two Cotswold ewes deserves special mention. They had been shown at the Monroe County Fair, where they contracted catarrh of the air passages, but at the close had so far improved, that the owner felt warranted in sending them on to Albany. The fatigue and exposure so aggravated the case of one that it arrived in a dying state, and perished about two hours after coming on the fair grounds. Disease: Bronchitis with congestion of the lungs.

The second seemed, on arrival, to have only a slight catarrh, a common condition in sheep which had come by rail, and did well until the night of 29th September, when it ate its usual meal and was left in apparently good health, but was found dead in its pen next morning. Death resulted from the parallel disease to *black-leg* in calves. The blood was diffluent and almost incoagulable; its colouring matter was partially dissolved in its fluid part; spots and patches of blood staining were abundant on all the serous membrames and in the tissues; and the whole length of the neck, from the lower jaw to the chest, was the seat of an enormous extravasation of black tarry uncoagulated blood. This ewe was doubtless predisposed to the disease by the slight previous illness, the excitement of railroad travelling and the continued penning up at the two fairs; but the immediate or exciting cause appeared to be the extreme alternations of temperature of the two preceding days and nights—the mid-day heat having reached a summer-like intensity, while the night of the 29th especially was very cold and chilly. Such vicissitudes of temperature are among the most common exciting causes of this class of maladies, but only, it would seem, in systems which already harbour the seeds of the disease, derived from malarious emanations. As further factors the change of food and water doubtless had their influence in rousing the morbific germs into activity.

Beyond this, advice was mainly sought on local injuries, lameness, etc., all of which, with one exception, were contracted before coming to the fair.

The excellence of the buildings deserves special mention as contributing to the comfort and well-being of the stock. Some improvements might still be made in the water, either by securing a supply from a greater depth, by preserving rain water, or otherwise.

JAMES LAW, *Consulting Veterinarian.*

LETTER OF THE PRESIDENT OF THE SOCIETY TO THE PRESIDENT OF THE ALBANY AGRICULTURAL AND ARTS ASSOCIATION, AND THE LATTER'S REPLY.

At the meeting of the Executive Committee, held at the President's office, on the Fair Grounds, on the first day of October, 1873, being the last day of the Albany Fair, it was

Resolved, That the President be requested to address to the President of the Albany Agricultural and Arts Association, a letter expressing the cordial thanks of the Society for the the use of the Association's well-chosen grounds and elegant and appropriate structures, and for the comprehensive and satisfactory arrangements for the Socie[illegible] accommodation, and the courtesy and kindness [illegible] fficers of the Association.

The [illegible] the Society thereupon addressed to the [illegible] W. Olcott, President of the Albany [illegible] etter, and received the reply which [illegible]

Geneseo, Oct. 4, 1873.

[illegible]n. Thomas W. Olcott, President of the Albany [illegible]gricultural and Arts Association:

My dear sir—At a meeting of the Executive Committee of the New York State Agricultural Society, at the close of our recent exhibition at Albany, it wa[illegible] unanimously ordered that the cordial thanks of the Society be presented to the Albany Agricultural and Arts Association for the use of their well-chosen grounds and elegant and appropriate structures, as well as for the comprehensive and satisfactory arrangements for our accommodation, and the uniform courtesy and kindness of the officers and agents of your association.

In conveying to you, on behalf of the Executive Committee, this resolution, I but give expression to the general sentiment of approval, not only of the committee, but also by the thousands of our fellow-citizens, from different parts of the State, who attended the Fair, and were thus afforded an opportunity, as exhibitors and observers, to judge of the admirable arrangement of the buildings and their completeness and adaptation to the uses of an institution of the kind you contemplate.

The marvellous rapidity with which the work of grading and building has been pushed forward, in order to be made ready for our occupancy, reflects the highest credit upon yourself and your associates, and especially upon Maurice E. Viele, the able and energetic chairman of your executive committee.

The public-spirited citizens of Albany, who have so generously embarked in the great enterprise which our Society has this year so successfully inaugurated, are deserving the lasting gratitude of the people of the whole State, and I confidently anticipate that it will prove a most important element in the prosperity of your city. I am, my dear sir, with great respect.

Your obedient servant,

B. F. Angel,

President New York State Agricultural Society.

Agricultural and Arts Association,
Albany October 9, 1873.

The Hon. B. F. Angel, President New York State Agricultural Society:

My dear sir—I have your highly-esteemed favour of the 4th instant, and I assure you we are happy to receive, in terms so graceful, the expression of your satisfaction with what we have done to meet the wishes and further the objects of your Society. I cannot convey to you the full measure of our rejoicings in the success which has so far crowned our labours; and still greater will be our rejoicings if your letter shall breathe

the inspiration of its noble spirit into our citizens to such a degree as to insure the final and complete success of our enterprise.

Our grounds will always be at the service of your Society, and we shall be happy of every opportunity for renewing those personal acquaintances which the present occasion has enabled us to form, and has taught us how to estimate and value.

With the most cordial regards, dear sir,

Yours,

THOMAS W. OLCOTT,

President Agricultural and Arts Association.

ARE NOT MOST OF OUR LOSSES BY LIVE STOCK PREVENTABLE?

A paper read by Mr. J. J. MECHI before the London Farmers' Club, Nov. 3, 1873.

(*From proof sheets furnished by the author.*)

I think that they are. It is an old adage that prevention is better than cure; I therefore speak only of prevention, and not of cure, for I leave that to our able veterinarians, foremost among whom stands Professor Simonds, whose numerous, profound, lucid and instructive papers in the Royal Agricultural Society's *Journal* on the various diseases to which our animals are subject, I strongly commend to juvenile agriculturists.

The subject for discussion this evening is so large in all its proportions, and so important, that I can only deal with it generally and referentially, but will give you the results of my 30 years of observation, inquiries, readings and experience, for I have been all my life a learner, believing that knowledge is power and ignorance weakness. I know that most of the older members of this club are "well up" in the business of stock-keeping, but this paper and its references, with the discussion arising upon it, may, through the medium of our valued agricultural press, be useful to young beginners in agriculture, who have to gain, or perhaps purchase, at a very heavy cost of sad experience, the knowledge of proper live stock management. No doubt the more we become book-farmers, uniting "practice with science," which has been the motto on the title-page of the Royal Agricultural Society's *Journal* ever since 1840, the more we shall know of the causes of disease (for every effect has its cause), and thus prevent rather than remedy. When I refer to any subject in those 33 volumes of the *Journal*, and get the benefit of the brains or experience of the most able and intelligent agriculturists and philosophers (too many of them, alas! now no more), I feel grateful that they have bequeathed to us so much valuable information. One of the best evidences of the value of prevention will be found in that admirable and instructive paper, "A Practical Essay on the Diseases of Sheep," by Mr. Henry Cleeve, Royal Agricultural Society's *Journal*, vol. i., p. 329.* His conclusions would apply equally to other animals, especially where he says: The majority of the diseases that I have mentioned proceed from a sudden change from a scanty to a luxurious diet.

HOW MUCH IS OUR ANNUAL PECUNIARY LOSS BY LIVE STOCK AILMENTS AND ACCIDENTS?

According to the latest return (1872–73), we have in the United Kingdom, on our 47,000,000 of acres:

	Horses.	Cattle.	Sheep.	Pigs.
Great Britain...	962,840	5,964,549	29,427,635	2,500,259
Ireland	532,146	4,142,400	4,482,053	1,042,244

—or, number to every 100 acres under crops, fallow, and grass:

	Horses.	Cattle.	Sheep.	Pigs.
Abont...........	4	20	72	8

If we take the value of these at £450 per 100 acres, it will give for our 47,000,000 of acres returned to the Board of Trade, £208,846,000 as the total value of farm live stock and farm horses in the United Kingdom. This estimate is framed on the present greatly enhanced prices. Our average consumption of home-grown meat is estimated at £76,000,000, or 32*s.* per acre. Shall I be wrong in estimating the loss at 3 per cent. per annum, or a total of £6,265,380, or in estimating the loss by horse stock alone at 1*s.* 6*d.* per acre? Many a worthy agriculturist is made unhappy or ruined by losses of stock, and I observe that nearly every candidate for relief from the Royal Agricultural Benevolent Institution quotes losses by stock as one prominent cause of his misfortune.

Animals are, physically, like human beings, and, like us, their health depends on proper and properly prepared food and drink, regularly available or supplied, and a comfortable dry resting-place, an equable temperature, absence of draughts, but, when housed, ample ventilation and circulation of air. Unfortunately most of these rules are too often violated or neglected, especially in the transit of cattle, either from Ireland, from abroad, or even from place to place in our own

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* He says: "After thus enumerating, at greater length than I at first intended, the ordinary diseases of sheep, I will beg the attention of the sheep-master to some precautionary rules, which at first sight may appear commonplace, but which experience daily tells me are too much forgotten in practice. The object of the farmer ought to be to grow as many sheep on his farm as is consistent with the feed it supplies, and if he exceeds or falls short of this just proportion, he will either way be a loser. This is too obvious to require much illustration. In the former case, the sheep are starved, and will neither do justice to the land nor pay when sold to the butcher; in the latter, much valuable food is wasted, and his profit, as a matter of course, diminished.

"Another point of consideration is, the sudden change of food to which some subject their flocks. The majority of the diseases that I have mentioned in the preceding pages proceed from a sudden change from a scanty to a luxurious diet. It is no uncommon occurrence to see a flock or herd, which has been nearly starved during the winter, suddenly turned into abundant pasturage on the approach of spring; or others, which during summer or autumn have received little attention and been hardly folded, abruptly put in coleseed or turnips. Diseases arising from indigestion and repletion soon follow, and the farmer is astonished at the extent and rapidity of his losses.

"All this might have been avoided by making the transaction a little more gradual. At night the sheep should be removed from their new feed, good sweet hay should, for a time, form a considerable portion of their diet, and, by slow degrees, the flock might be initiated, as it were, into the full enjoyment of their rich succulent provender.

"Again, a farmer sometimes attends a fair, and purchases a lot of sheep that have been driven a long distance, and for several days have had little better grazing than they could pick up by the side of the driftway. When he gets them home he immediately turns them into his best grass, and by this imprudent act introduces fever or dysentery into his flock. Had he, on the contrary, placed them on a short cool pasture for a few days, their condition would have improved, and the tone of their stomachs and bowels have gradually risen to the due strength for the reception of richer food.

"The farmer, on purchasing his stock would do well to inquire into the description of the soil to which the lot had been previously accustomed, and also into their previous habits, as whether they had been folded, etc. If the sheep had been bred on land much superior to his own, he would be wise to reject them, for they are unlikely to thrive on inferior pasturage. If they have come from inferior soils he must be very careful in preparing them by gradual indulgence for the richer feed to which they are about to be transferred. I will add but one more observation. A wise farmer will never confide his flock to the exclusive and unwatched care of his shepherd, however clever or trustworthy that servant may be."

country, thus creating and spreading disease most extensively and ruinously. On this subject I would refer you to Mr. Jenkins' able and exhaustive paper in vol. ix, p. 187, Royal Agricultural Society's Journal (new series).

What would be the consequences to ourselves if we were kept without food, drink or repose for a day or days; at one time packed closely and sweltering in a superheated and pestilential atmosphere, and afterwards suddenly whirled through a cold blast at the rate of 20 or 30 miles per hour, excited and deprived of our food, rest and tranquility? Of course we should, many of us, become ill or diseased, and probably spread the pest among our friends and neighbours. Overcrowding and want of ventilation in the horrible Blackhole at Calcutta killed three-fourths of our immured countrymen in one night. Let public opinion, acting through our government, put an end to such cruel and unprofitable practice, for be the cost of change what it may, agriculture and the public at large would thus be considerable gainers. Already a more stringent supervision in our ports, markets and farms has done much good, but a more uniform severity is required to keep in order obstinate, negligent or reckless and greedy unprincipled stockholders and dealers.

Animals cannot, like us, express their feelings, wants and sufferings in words, therefore we must learn them from their looks, movements demeanour and appearance. Unless a stockman has a quick eye for any indication of pain or uneasiness, vain must be our expectation of profitable results. Sudden changes of food or of temperature are prolific causes of disease, and so is the practice of alternate over-feeding or starving. We know that the discomforts, exposure and irregularities of campaigning engender and greatly increase disease and mortality both in men and animals, therefore the opposite of all this must promote health and prevent loss. I am often reminded of this when I see animals in mid-winter standing imploringly at the gate, or nibbling at frozen turnips, or on bare pasture, or lying on wet ground, with rain or sleet above.

Land undrained, either naturally or artificially, is a prominent cause of ill health or disease to man and beast. On that point there can hardly be a difference of opinion, for the evidences are abundant; besides, we know that on the chalks, limestones, and other self-drained and dry lands, flocks, herds, and plants thrive and are free from disease. The wet season and wet land of last year were, in my opinion, fertile sources of foot-and-mouth disease (fever in fact). A damp bed is injurious alike to men and animals.

The proper variety, admixture and preparation of food prevents much loss How beautifully is this exemplified in a good natural pasture. There you have a great variety of plants ripening at different periods, and possessing various properties and flavours (see Professor Way's admirable paper "On the Relative Nutritive and Fattening Properties of Different Natural and Artificial Grasses," *Societys Journal*, vol. xiv, p 171).

Not only is there a due provision of all the elements of the natural body, but likewise, at a proper stage of their growth, a due proportion of water, say about 76 per cent., just as it is in our own or our animals' bodies, viz.: 76 per cent. of water to 24 per cent. of dry matter. Careful housewives little think that in a pound of lean beaf they purchase three-quarters of a pound of water. No wonder that the agricultural labourer finds bread and cheese his cheapest and most nutritive food. So, when we give to our animals good hay and cake and a moderate supply of roots, the dry and wet proportions are fairly distributed. The best papers ever written on dairy farming and stock feeding are those by the late Mr. Horsfall, in vols 17 and 18 of the Royal Agricultural Society's Journal, for there cause and effect are duly exhibited, practically and chemically.

Agriculturists are gradually finding out that, by the mixing of the too watery pulped turnips or mangel with the too dry hay and straw chaff, they have attained the happy medium of suitable food. Many flocks are injured by not giving water when the sheep are on very dry grass in hot weather, or when they have dry corn and cake. Animals, like ourselves should always have access to water, and their own instinct will teach them the need or non-need of it Much loss occurs, especially to breeding flocks before parturition, by an over-supply of cold and watery turnips, for they contain 90 per cent. of water, and, unless supplemented by dry food (hay, cake or corn), they are unfit food for the formation and development of the unborn animal.

Diseases are, as it were, bred by improper conditions of the human or animal system or its surrounding influences The food may be too rich or too poor, too dry, or too watery; the atmosphere and water too impure; the climatic influences too much disregarded or neglected.

My Losses by Diseased Stock.

I have, as a farmer, been rather fortunate in avoiding losses, for I have escaped rinderpest, and, with trifling exceptions, pleuro-pneumonia, foot-and-mouth disease, small-pox, scab, rot, foot-rot; also, heaves and measles in pigs. Although I have, in thirty years, sold nearly £30,000 worth of fat stock, my loss has been under £300. Horse stock has not fared so well, for the loss amounts to two-thirds as much as that on all other stock; and yet I am told that I have no reason to complain, as we work our horses so severely.

I attribute my exemption from loss to the following causes:

Shelter, ventilation, and circulation of air.

Well drained land and deep cultivation.

Avoiding, as much as possible, purchases in fairs and markets.

Breeding our own sheep.

Rearing calves (until the cattle plague).

Isolation from contact by folding sheep, and by shedding cattle in covered, inclosed and well ventilated yards.

No roaming at large for either sheep or cattle.

An ample and regular supply of various kinds of food, intermixed and properly prepared.

Good water always available.

A very scanty supply of turnips (never mangel) to breeding animals prior to parturition, preferring cabbage and kohl-rabi

A strict observance of the quality of cake, whether linseed, rape or cotton.

An avoidance of hard, dark cotton cake, containing too much of the bark or husk of the cotton seed.

Avoiding mustardy rape cake.

The use of a small proportion of condimental food for fattening animals.

I attach the utmost importance to shelter for hairy animals, especially to protect them from the east or northeast winds. Professor Simonds attributes many evils to the east wind; and no doubt there is a sound reason for the old adage—

"When the wind is in the east
'Tis neither fit for man nor beast."

An easterly wind brought us the cholera of February, 1832.

How different are our feelings with a south or west wind, coming to us over 2,000 miles of water, whereas from the east it passes nearly all the way overland.

Professor Simonds justly says, "the air may be vitiated by an admixture of various matters," and Professor Tyndal has enlightened us as to that fact.

The chill caused by an easterly wind is disagreeable and immediately perceptible; an easterly wind once caused me the loss of several healthy calves, and we know that it covers our hedges with caterpillars, our beans with the collier, and our peas with the green fly. I have seen even sheep affected by it. I never turn out hairy animals, except occasionally in the summer months; my losses have almost always occurred to out-of-door hairy animals, or from draughts of cold air.

RINDERPEST AND PLEURO-PNEUMONIA

We know how to stamp out rinderpest, which does not appear to be indigenous to this country, but I have not heard that inoculation has been tried as a preventive, nor would it be desirable; but the lung complaint is familiar to us, and is, we know, produced in man and beast by various obvious causes. I have long been assured and believed that inoculation is a certain preventive of the disease, but it is only recently that this disputed question has been set at rest by the extensive and almost general practice of inoculation in Australia, the details of which you will find in the *Veterinarian*, or copies from it in recent numbers of our weekly agricultural press. It does not appear to have been indigenous there, but was first brought to the colony by a cow from England, in 1858. The loss to the colonies by its spreading was ruinous, and estimated at £8,500,000. At length, in 1862, inoculation was tried, and soon became almost general, and thus the spread of the disease was arrested. I trust that in this country we shall no longer doubt that it is highly infectious, and guard against its spread accordingly.

The letter I allude to is from Mr Alexander Bruce, Inspector of sheep, New South Wales, and is too long to read this evening; but it is highly important and instructive, and also suggestive of the danger we have escaped by stamping out the rinderpest. No doubt it will be generally sought and read.

I trust that rinderpest may never reach Australia, for it would be ruinous. An attempt to stamp out the pleuro in the first instance was defeated by the roaming at large of cattle, which rendered unavailing all future similar attempts at checking the disease. Inoculation was found to be the only preventive. I wish the letter had stated the best means of performing the operation, which we require to know here. At p. 201, vol. xviii, Royal Agricultural Society's Journal, Professor Simonds says:

"Pleuro-pneumonia has prevailed mostly in those localities and places where secondary causes are in full operation to predispose animals to its influence; hence its continuance in the ill-ventilated, over-crowded, and badly-drained cow-sheds of the metropolis and other large towns, and on the 'cold, retentive soils' and undrained farms in the country, especially such as lie in exposed situations."

Mr. H. S. Thompson, in a foot-note on the same page, expresses his belief that it is not infectious (there he is wrong); but he adds, "I could generally trace the outbreak to the prevalence of cold fogs, or to rapid alternations of temperature, especially if occurring in spring or autumn." I concur in this opinion, and I attribute my general freedom from cattle diseases to the fact of the animals being always, during those seasons, in covered and inclosed places, properly ventilated, but free from draughts. In June, July and August there is little risk in turning out, but it is otherwise in early spring, chilly autumn and winter, as I have found by experience.

It is a melancholy fact, and a national disgrace to our rich, wealthy country, that some three-fourths of our wet land are still undrained. I know from experience that non-drainage acts most injuriously on both man and beast. A neighbour of mine, who came from Lancashire, was obliged to remove his children until the land around his house had been drained; after that, their health was good. The drainage of this neighbourhood has rendered it very healthful.

Dairy farmers and cow-keepers are often great sufferers from pleuro-pneumonia. It is, however, proved to be preventable by inoculation. A large and successful cow-keeper (Mr. Hall, of Navestock, near Romford) was induced to practice it on the recommendation of a milk supplier, who had made a fortune and retired and who had always practiced it and avoided losses. Whenever Mr. Hall purchases a cow, he makes a very deep vertical incision with his small pocket-knife, in the second joint of the tail, near the rump, cutting down to the bone, and into the opening inserts a piece of the decayed lung of a bullock or cow, binding it firmly in its place. Inflammation soon takes place, and in some instances the cows lose their tails, but they are ever after safe from the disease. The loss occasioned by this process is about three in every hundred so operated on. He tells me that the main point is to obtain from the slaughtering butchers a portion of diseased lung in its early stage. This is most important. Some of the large and successful cow owners in France practice this system.

The following is from the *North British Agriculturist* of October 16:

"*Inoculation for the Prevention of Pleuro-Pneumonia.*—I have waited to see if Mr. Bruce's letter on pleuro-pneumonia, contained in your impression of the 3rd ult., produced any article or comment. Having sustained much loss from this cause, I consider the subject of vital importance, and hope, if Mr. Bruce has not left the country, he will publish any further conclusions he may arrive at on the point. I would also like some detailed explanations of the proper manner of taking and using the right sort of virus, and properly conduct- the process of inoculation, for, whilst very forcibly dwelling on the ill effects of improperly performing the operation, Mr. Bruce leaves us without much information as to what is the real experience the colonists have so painfully acquired. *A Southern Farmer*. [Mr. Bruce will doubtless publish the results of his investigations regarding inoculation for the mitigation and prevention of the contagious pleuro-pneumonia of cattle. A good many of the London dairymen have for years pursued the plan of inoculating every fresh acquisition to their stock, and can afford interesting facts and figures respecting it. The growing favour in which the practice is regarded by intelligent dairymen, and the more extended adoption even in the country, afford practical evidence of its value. On the Continent, the operation has always been more approved of than in this country, where it was discouraged by Professor Simonds, and also by the late Professor Dick and Mr. John Barlow. There is not much difficulty in securing suitable matter for inoculation. The lymphy fluid or exudate should be taken from the lungs of animals in the second stage of pleuro; blood and pus, and especially malignant cases, should be avoided. For immediate use the lymph may be taken direct from the diseased lung on the point of a lancet, or some threads of cotton saturated with it can be used as a seton. For keeping for future use it may be stored in tubes, or between flat pieces of glass, like vaccine lymph. Ten or twelve inches below the arch of the tail is the spot usually selected for operating; a scratch is made through the skin without drawing blood, and the lymph gently rubbed into the absorbing connective tissue; or a seton soaked in the exudate is drawn underneath the skin. If the inoculation takes, the wound usually swells up a little. For a few days the animal is feverish, but soon gets all right. Occasionally, considerable local inflammation occurs, sometimes terminating in sloughing the

end of the tail. It is the risk of such degenerate inflammation extending into vital parts that justifies the tail being selected for inoculation.—*Vet. Ed.*]"

Sheep, being well protected by woolly jackets, are less subject to external climatic influences than hairy animals, but when shorn too early they should be sheltered.

We have every day proof that certain conditions encourage or produce disease, both in men and animals. The Irish famine caused much loss of life by generating typhoid and other diseases, and we need not wonder that the nearly starved store cattle sent to us from Ireland are just in that condition which endangers health, especially under adverse conditions.

Professor Simonds, in his exhaustive and able paper on Animal Respiration and Circulation (Society's Journal, vol. x, p. 601), justly remarks:

"Whether an epizootic be or be not a contagious disease, its victims are rendered susceptible of receiving the malady by the operation of secondary causes. This predisposition, as it is called, may be induced from a variety of circumstances, and a mere alteration in the food will be occasionally sufficient to produce it. A want, however, of nutritious diet, exposure to the changes of the weather, pasturing on wet and cold soils, neglect of a proper ventilation of the buildings the animals occupy, inhalation of offensive gases from accumulated manure, the fatigue of being removed from one locality to another, are the general predisposing causes of pleuro-pneumonia and similar diseases.

"Care should, therefore, be always taken by a better system of management, feeding, etc., to avoid everything which tends to bring the system into a condition favourable for the reception of the special cause of an epizootic, and more especially when such is raging in the neighborhood.

"All these means will, however, fail when the disease is purely an infectious one, from a neglect of isolation, or the removal of the healthy from the diseased. It is a well ascertained fact that infection has its limits; and although these may ever remain undefined as to their extent, still daily experience proves that the removal of animals but a short distance from each other, and the prevention, also, of indirect communication between them, will at once put a stop to the spread of the malady."

We can guard against contamination, but not in the open fields on the roaming-at-large principle.

My animals escaped the rinderpest, which destroyed my neighbours' cattle, because I did not permit any of them to roam at large in the fields.

A white frost is often a costly affair where animals are in open fields. Landowners who desire that their tenants should prosper will do well to consider the changes and new requirements of modern and intensified farming. Suitable buildings for costly machinery, pedigree stock, and for sheltering increased numbers of feeding stock, have become a necessity for modern agriculture. Increasing rents will cover such additional investments.

A Hospital for the Sick

is essentially necessary. The moment an animal shows signs of discomfort, it should be separated from the rest. If from over-feeding, stop the supplies, but let it have free access to water and a lump of rock salt in the manger. A clear-out by an aperient dose is generally a good beginning. I knew a ship captain who, if he met with an accident, at once took an ounce of Epsom salts to prevent inflammatory symptoms. An angling friend of mine, who was very stout, was suddenly struck down by my side by paralysis. I asked the medical man, who was soon in attendance, what was first to be done in such cases, and he at once replied, "a clear-out." A farmer told me he always used cold-drawn linseed oil as a safe and effective aperient, and another said for the throat-worms in young calves he used linseed oil and turpentine—the linseed oil, of course, cold-drawn. In reply to my question, a medical man assured me that the stomach would safely receive much turpentine, and the bowels (by injection) even more—diluted, of course.

I knew a farmer who had a *penchant* for gin, and as he was ten miles from the county town, and his bottle too often empty, he used to have recourse to the turpentine bottle, and made shift with certain strongly mixed tumblers of turpentine grog without inconvenience. He lived to be nearly eighty.

Turpentine is, I am told, fatal to internal worms. Hot lime-wash is a most wholesome and valuable preventive and cleanser of our stables and sheds. So uncostly a substance should be occasionally used, for want of cleanliness is the cause of much disease in man or beast, and so is dampness. The ground on which buildings are erected should always be well and deeply drained, if not naturally porous and filtrative.

Food, and the Mode of Administering it.

Irregularity in feeding acts injuriously on stock. Like ourselves, animals (not on pasture) look for their food at the appointed periods. We know practically that the omission of one's meal at the usual time causes flatulence, dyspepsia and uncomfortable feelings. An inattentive and irregular stockman should be got rid of without delay.

The proper qualities, quantities and admixture of food have much to do with the health and progress of animals. The carbonaceous and nitrogenous should bear due proportion to each other. Science has enlightened us in this matter, thanks to our agricultural chemists. Food may be too rich, too nitrogenous, too glutinous, too laxative, or too astringent. Dressed wheat will kill a horse, but if he eats it as it is grown, with its chaff and straw, no damage ensues. A neighbour lost five horses which ate freely of dressed wheat in a barn. Rank, young, rapidly-grown grass will often kill animals; so will too much bean meal, unaccompanied by more carbonaceous, succulent, or oleaginous food. A certain plain farmer fed his cattle on bean meal mixed with linseed oil, made into balls, in addition to other food. He was a philosopher The oil was carbonaceous and laxative, the bean meal nitrogenous and astringent. His beasts were a picture.

I dare not fold my lambs on young Italian rye grass forced by a dressing of Peruvian guano washed in by our jet, but can safely do so when the grass is produced by the bullock manure from under the sparred floor, washed in by hose and jet. The Peruvian guano was disproportionately nitrogenous.

I seldom lose a ewe or lamb in parturition, for they are fed on the mixed food principle, and I carefully avoid giving them mangel before lambing, and only a very small quantity of turnips; but I much prefer cabbage, both before and after lambing. I often hear of very heavy losses of ewes and lambs at lambing time, when they are fed entirely on turnips, especially if those turnips have been forced to a luxuriant growth by superphosphate of lime or guano. As turnips contain ninety per cent. of water, they are clearly unsuited (as a sole food) to form in the breeding animal a well-developed lamb, calf or pig. On this subject, let me quote the following passage from a paper which I read before the Wenlock (Salop) Farmers' Club, in April, 1866, "On the Cultivation of Green Crops, and the most economical way of consuming them," which you will find at page 46 of my book entitled *Profitable Farming:*

"It may appear strange that, while 7 lbs. of barley, bean meal or oilcake will make 1 lb. of meat, net butcher's weight, it takes 150 to 200 lbs. of turnips to produce a similar result. In one case we must give water,

as well as other food, with the meal or cake; in the other they are obliged to take 90 per cent. of water in the turnips, or 63 lbs. (8 galls) of water to every 7 lbs. of meal or cake. It appears absurd to propose to do this, but it proves that turnips alone are not proper and profitable food for animals. Beware of too succulent and unripe food, especially for young and for breeding animals before parturition. Young washy tares, young rank growing grass, and roots, especially mangel, forced to a rapid growth by high farming and artificial manures, are all likely to produce scouring or inflammation of stomach; so are mildewed turnips and rape, and green rape after frost. Male sheep, especially rams, suffer much in the urinary organs from the salt and alkalies in mangel-wurzel, especially if confined; when permitted to range the fields there is less danger. The ash of globe mangel bulbs contains 24¼ per cent of salt, the ash of their leaves 38¾ per cent.; long red mangels contain, in the ash of their bulbs, 14¼ per cent. of salt, and in the ash of their leaves 29¾ per cent.; Swedes and carrots only contain, in the ash of their bulbs, 6 per cent. of salt. All these roots contain, in their ashes, very large quantities of potash and soda. More than 50 per cent. of the ash of mangel is so composed. For breeding animals, both before and after parturition, cabbage may be very safely given, alone, or passed through the pulper and mixed with chaff. If we ask why, the analysis of the ashes at once explains it. In lieu of the 50 per cent. of soda and potash, and the 30 per cent. of salt, the ash of cabbage has less than 5 per cent. of salt, and 30 per cent. of potash and soda; but it has (which is very material) 20 per cent. of lime and 5 per cent. of magnesia (globe mangel has in its ash only 2 per cent. of lime and magnesia). The ash of cabbage has also 12 per cent. of phosphoric acid, mangel only 4¼ per cent. It is thus easy to understand why cabbage, abounding in flesh and bone forming substances, is so innocuous and so suitable for animals in breeding condition. Kohl rabi has much the nature of cabbage. Carrots are safe food, having only 10 per cent of salt. From Way's Analysis of the Ash of Mangel, vol. viii, p. 157, Royal Agricultural Society's Journal, it appears clearly that when we give our cattle 3 bushels, or 150 lbs. of mangel roots, they not only got 13¼ gallons of water with only 15 lbs. of dry food, but they also get, in that dry food, 6 oz. of common salt, 6 oz. of potash, 4¼ oz. of soda. Can we wonder that such a dose of salts daily scours them or loosens them too much? and does it not prove the necessity for giving them much dry food as a neutralizer? Undecorticated, dark, dry cotton cake, which would probably injure an animal fed on dry food, would neutralize the relaxing mangel. A grazier told me that last season his neighbours' beasts progressed more rapidly on hard undecorticated cotton cake than his own did on linseed cake, the animals being always on pasture. The reason was obvious: that very wet season the grasses were not only often wet outwardly, but were unusually succulent and laxative. The dry cotton cake remedied this defect, while the slippery linseed cake rather increased it. It is probable that the dry cake might be useful in correcting the laxity caused by a large consumption of fresh mangel or turnips. Whenever we deviate from the natural state of food for animals, say three-fourths water and one-quarter dry matter, we must control the deviation rather by more dry food or more water. Dry cotton cake is rendered more safe by being soaked in water for twelve hours. It will absorb a large quantity. Soaked and softened beans are more safe than dry ones in certain cases. Meal is of a dry nature, and is best mixed with chaff and pulped roots."

Ewes and Lambs.

A teaspoonful of castor oil in a little warm milk, given to newly-born lamb, saves many lives by removing the sticking contents of the bowels. I rarely give roots to my breeding animals before parturition; they contain so much common salt, potash and soda. Cabbage is a much safer food.

Salts in Roots.

Twenty-eight pounds of turnips, with their tops on contain half an ounce of common salt (the tops alone contain 1¼ oz. in 28 lbs.); 28 lbs. of mangel, with their tops on, contain 1¼ oz. of salt; 28 lbs. of mangel leaves contain 2¼ oz. of salt. Both turnips and mangel have also a large quantity of potash and soda.

Effect of Salt in Turnips on Breeding Ewes.

In vol. viii, p. 190, Royal Agricultural Society's Journal, Mr. Robinson, veterinarian (Royal Agricultural College), says:

"When lambing ewes are allowed a large quantity of turnips, with a small amount of other food through the winter, abortion is a frequent occurrence, their supply of milk is very deficient, and their lambs are dropped of very various sizes, and far from healthy. The mortality of the lambs in these cases may, I think, be fairly attributed to the amount of salt taken by the dam in the turnips."

This applies with still greater force to mangel wurzel, which contains more salt than turnips, and is dangerous for breeding animals generally. I have a strong conviction that my exemption from loss in sheep or lambs is owing to my giving them at all times mixed food. When on pasture, clover or roots, we always keep our lambs in a fattening condition until twelve months old, when they are sold as fat mutton (this year at 73s. each). They are half bred by Lincoln tup and black-faced Down ewes. Our loss is seldom so much as two per cent. from the time of lambing, and rarely one per cent. in ewes. Fat sheep make fat crops..

Low Pastures and the Rot.

We know that the insect tribes abound in pasture. Watch the habits of birds and poultry, and you will soon be convinced that sheep and cattle must partake largely of the eggs of insects, if not of the insects themselves; and thence arises the question, Can those eggs or juveniles exist in the animals? And there also arises another important question, Can these insects live in either stomach when the grass or green food is mixed with corn, cake, meal, malt combs, bran, and straw chaff? My experience leads me to believe that such admixtures are fatal to insect development within the animals.

I heard of a case where sheep fed on certain low meadows became always affected with rot or liver-fluke. The farmer gave his sheep daily 1 pint each of barley (valued 1*d.*), and at no time after were the flocks so treated affected.

Undrained swampy land encourages the liver-fluke. I recommend a perusal of Professor Simonds' able paper on rot or liver-fluke, in the Royal Agricultural Society's Journal, vol. xxiii., p. 64.

The Fly.

When I wish to skeletonise a fish or a bird, I place it in a box with carrion gentles, and they will soon leave it a perfect skeleton. So it will be with your sheep if you neglect them. The fly is sagacious, and lays her eggs where and when there is moisture as well as food. Sheep that scour, or get a warm shower upon them, are immediately struck by the fly, which deposits its eggs, and in an hour or two, more or less, thousands or millions of juvenile gentles commence devouring the sheep, growing every day larger in size and consumption until full grown; then they become a chrysalis, and afterwards a fly, so that we may safely say that the neglected sheep, *minus* its bones and skin, has taken flight.

A good shepherd will at once detect by the sheep's manner that it has been fly-stricken, and apply the proper dressings. Warm, showery weather demands anxious and constant supervision. In a very dry time my shepherd was surprised to find some of our sheep fly-stricken. It appeared that some children had amused themselves by sprinkling water on the sheep's backs while drinking, and the fly availed herself of her opportunity.

FOOT ROT

gives strong evidence of the necessity for draining and an occasional dry bed for the animal; for if the horn of the hoof is kept constantly soaked, it softens and rots. Sheep will always choose a dry resting place if they can find one. Our best flocks came from the chalks and limestones, and love dry sand or land naturally filtrative and dry—not from the swamps or cold and undrained clays. It is of no use dressing the sheep's feet unless they are immediately afterwards placed for a time under cover on dry straw or ground. Every shepherd ought to know how to cure foot-rot.

PIGS

are interesting animals, for so many people keep a pig. In my early farming days I used to keep a good many, having had 360 or more at one time (good Danish barley was then 18*s*. 6*d*. per quarter), and my knowing friends said that I should certainly breed disease, having so many and so closely packed, but I was singularly fortunate. The fact is that pigs have a habit of "close packing," or huddling together, so that the air around them becomes putrescent and unhealthy. That is why reedy wheat-straw, frequently changed, is considered more healthy than soft barley straw. The former permits more circulation of air under the pigs.

In my case they were always placed on sparred floors, with a space under them from 1 to 5 feet deep; therefore the air, heated by their breath and bodies, was carried off by circulation under and around the animals. Fat hogs, in hot weather, often get fever; not so on the sparred floors. Pigs generally excrete in a corner, away from their beds.

The openings between the boards or spars may be narrower or wider, according to the size of the pigs. In all cases the floor should be firmly supported, and free from elasticity. Those who prefer it, and in cold weather, can place a little clean straw on the floors; as the urine passes down through the openings, a thin straw matting might answer. Mine had no straw. For breeding sows and small pigs the openings should be only half an inch. A projecting shelf, about 9 inches wide and 6 inches from the ground, would prevent the sow overlaying her pigs. It is a general practice in Essex to keep fattening calves on sparred floors; that is, boarded floors with an opening between each board, and a space between the boards and the floor, spreading straw over the boards. They say calves would not otherwise do so well. Why it has seldom or never been extended to cattle, sheep, and pigs, I do not know.

In hot weather I used to turn the jet of water upon them, and after a few dressings they enjoyed it. Their skins became as clean as the back of one's hand, and they progressed rapidly without fever.

One great advantage of sparred floors is, that the pigs cannot burrow or bury themselves in holes, or in hot manure; for if they do so, and come afterwards into cold air, they get heaves or lung complaint from the sudden change.

In winter, draughts should be prevented, as they have no wool and very little hair to protect them—not like a Russian or wild pig, with its thick and long bristles. A cooling aperient dose either before or immediately after parturition would in the case of sows as well as cows spare many a death by fever. It is desirable to avoid high and rich feeding some time before and after parturition. I have observed that, with brewers' grain, breeding sows do well. Mangel or roots are objectionable. Millers' middlings and toppings are a useful cooling food, and good for juvenile pigs. For fattening pigs, two-thirds barley meal and one-third pea meal make excellent pork, especially if aided by milk. Barley meal or bean meal alone is too heating for young pigs. Beans will give pigs cramp when not at large. A good pasture adjoining the piggery is useful for breeding sows and their young

FARM HORSES.

This is a tender and all-important subject; a farmer, especially a small farmer, is soon broke up if he is unfortunate with his horses. They are the motive power, the main spring of arable land; a strain, a kick, or other accident irrespective of disease, may cripple this important power. Besides, now it is a question of £60 or £70, or even £80, for a good heavy land 4-year-old horse. And this more and more strengthens my conviction that agriculture must look to steam rather than to horses for cheap and effective culture. A steam horse costs about £35 per horse power; in my case a fixed steam engine, 26 years old, is still good. We always grind our corn for horses, and cut all the hay and straw into chaff. They are manger fed; the dry chaff being watered by a watering-pot, so that the meal adheres to it. Clover, Italian rye, and tares, are all passed through the chaff-cutter. In autumn and winter each horse gets a bushel of pulped mangel; when our horses are very severely worked, we add 3 lbs. of linseed cake a day to their other food. Our horses are always stabled at night in stalls. Loose boxes are better.

A city contractor, who furnished carriage horses, assured me that by preparing the food by chaff-cutting, etc., he saved £8 a week in food, and £4 a week in losses of horses. Many of his coachmen gave up their prejudice in favor of long hay, but one refused to "fall in," and was discharged.

Mouldy hay (unless steamed) will kill horses. Cold water, when horses are heated, often produces flatulence and death. In the great breweries, a steam-pipe keeps the water always warm, so that the horses drink when they please without injury.

Cold milk will scour and kill very young calves. It should be as warm as the mother's milk.

Hoar frost on green food or roots kills many animals.

Inflammation is so rapid in horses, that immediate remedies are desirable. A clyster pipe and bladder should be always at hand, also a box of Day, Son & Hewitt's medicines.

A fatal kick sometimes costs more than a new set of stalls or loose boxes.

Riding heated horses into cold ponds should be strictly forbidden.

It appears unreasonable to cause a horse, after a hard day's work, to walk about for hours to crop his food; it should be prepared and brought to him. Farmers as a rule prefer open yards for their horses, because in their unventilated stables they would be unhealthy.

The late Mr. Watson's plan of ventilation is the most perfect. His successors reside at Halifax, in Yorkshire. A London firm fed their great horses on oats, beans, and the best clover-hay, and they were often unlucky with them. A friend suggested that the food was too rich, and advised mixing a portion of straw chaff with the cut clover. This set matters right.

Pea straw is very dangerous for horses, especially the straw of green peas picked for market. A farmer lost nine horses from eating pea-straw, and I lost one, my ploughman having, contrary to my orders, got some

from a heap intended for the cattle. The four-stomached animals (sheep and cattle) eat it safely. The London Omnibus Company, who have thousands of horses, always prepare the food for them. Mr. Church, Secretary to the London Omnibus Company, stated in his evidence before the House of Lords Horse Commitee that they purchased about 2,000 horses annually; in 1863 and 1864 the price was £23; in 1872 it was £32 17*s*. 8*d*. per horse. Their horses last on an average about four and a half years, and sometimes as many as five years. Most of them then go to the knackers at £2, 5*s*. each. Farm horses last much longer, especially if they have not much road work or subsoil ploughing.

DANGERS OF LONDON MANURE.

Nine cattle in Hertfordshire and six in Sussex were this spring lead-poisoned by feeding on pastures dressed with London manure, which included, among other rubbish, the scrapings from old paint pots. More than 50 were injured by it.

AN IRON WILL

is a valuable preventive, for unless you are firm and determined your instructions or orders will sometimes be evaded or negligently carried out. I have seen too much of that.

TIME WORKS MANY CHANGES.

I have lived when there was no gas, no railways, no electric telegraph, no ocean steamers, no cabs or omnibuses, no policemen, no penny post. No watchman, now, in our wakeful moments, calls the hours or describes the weather. We no longer smell, after midnight, the cesspool carts, for the food blood of the nation now flows wastefully to the rivers. How sad—how miscalculating!—how nationally suicidal! In this Club, 30 years ago, I was derided because I recommended the use of straw as food, rather than as litter—but a great change has come over the agricultural mind on that point, and there is a greater consumption of chaff than ever. So it has been, and will be, with many of my other recommendations.

IN CONCLUSION,

I feel that I have given a mere outline of a great subject, one well worthy the study of intelligent agriculturists, and deeply affecting their pecuniary welfare. I repeat, that in the journals of our four great agricultural societies, and in our current agricultural literature, will be found an immense mass of valuable information, almost demanding that we should, as agriculturists, read, mark, learn, and inwardly digest it.

My time is getting short, but I see clearly that if I could come again in 50 years a mighty change will then have come over our national agriculture as regards landowners, tenants and labourers in their relation to agricultural progress, intelligence, and improvement. Our landowners of that period will consider it no disgrace to understand the business and requirements of agriculture, and tenants will no longer sneer at science and theory. Education and intelligence will then have taught agriculture to adapt itself to mighty steam as a source of increased production, economy and profit. As this may be the last paper I shall ever read to you, permit me before I sit down to congratulate you and the country at large on a happy change which has taken place within the last 30 years. I remember that, many years ago (1849), when dining at the first formation of the Birmingham Cattle Show, Mr. Muntz, M. P., said, in dolorous mood, that he believed that a manufacturer ate a farmer for supper every night—and this sentiment was greatly applauded. Now, no longer are town and country supposed to have separate interests, no longer are manufacturers and agriculturists believed to be pecuniarily antagonistic.

How delightfully has the amiable and talented author of *Talpa* (published 21 years ago) anticipated this result. He says, at p. 56:

"O ye who tilled these fields and dug these marlpits, in the days of narrow lanes and pack saddles, what would you have said to the mail train, that was flying like a meteor through the night, upon its track of polished iron, annihilating distance, yet leaving space undiminished, turning the wide-spread country abodes of men into one vast metropolis of human society, mutuality and intelligence, not choked and deadened by long rows of bricks and mortar, like the dull, changeless, man-manufactured town, but open, and free, and independent as ever, with earth and air, and sky unpolluted, undescrated by the throng, yet man united, by the closest intercourse and sympathy, with the marts of aggregated skill and progress in each art and science that instructs, enriches and ennobles?

"Despise not the town, O man of gaiters, corduroys, and short cut-away, whose face is stereotyped into perpetual jollity by Nature's wholesome, merry hand—whose talk is of Swedes, superphosphates, and Red Lammas! Nor do thou despise the country, O frock-coated, sleek-hatted, umbrella'd town denizen, whose face is blanched and thoughtful, and mayhap, a little wrinkled, and whose talk is of prices-current, scrip, cargos, and consuls. For you are each other's customers and brothers; the iron artery of locomotive traffic, and the electric nerve of flying thought, have brought you into a new and closer bond of reciprocity and fellowship. It matters little at which end of the wire your place and life-task are appointed; your hearts and heads were cast in the same human mould, and it is hard but such a tie as now unites their throbs and thoughts shall strike out some results and combinations that you scarcely dream of yet, from the twin realities of agriculture and commerce."

REPORT OF EXPERIMENTS ON THE GROWTH OF BARLEY FOR TWENTY YEARS IN SUCCESSION ON THE SAME LAND—1852-1871.

By J. B. LAWES, Esq., F. R. S., F. C. S.; and J. H. GILBERT, Ph. D., F. A. S., F. C. S.*

SECTION VI.—*Summary and General Conclusions, showing the Practical Bearings of the Results.*

In a former paper it was shown, that wheat had been successfully grown for twenty years in succession on the same land; that the produce without manure had, during that period diminished comparatively little; and that by farmyard manure, and by certain artificial manures, had increased considerably. The thirtieth wheat crop is now growing, and shows no deterioration, in either quantity or quality, where the proper manures, natural or artificial, have been supplied. The most prominent result was, and still is, that

* The report, of which the summary and conclusions are here printed, occupies nearly two hundred pages of the Journal of the R. A. S. of England for the present year, and is probably the most thorough and exhaustive ever published, even by these patient and able investigators. The experimental field was divided into 24 plots and annually manured per acre as follows:

PLOT.
1 O. Unmanured continuously.
2 O. 3½ cwts. Superphosphate of Lime. (1)
3 O. 200 lbs. Sulphate of Potass (2), 100 lbs. Sulphate Soda (3), 100 lbs. Sulphate Magnesia.
4 O. 200 lbs. Sulphate Potass (2), 100 lbs. Sulphate Soda (3), 100 lbs. Sulphate Magnesia, and 3½ cwts. Superphosphate.

mineral manures alone increase the produce scarcely at all; that nitrogenous manures alone increase it very considerably; but that the largest crops are obtained when nitrogenous and mineral manures are applied together.

How far do the results now recorded in regard to *barley* accord with those which have been obtained with its botanical ally—wheat?

The results on the growth of barley, without manure, by farmyard manure, and by a great variety of artificial mixtures, each used for twenty years in succession on the same land, have been given in detail in the foregoing pages; and they have been compared with those obtained with wheat under corresponding conditions. They have been classified, and given in separate sections, and at the conclusion of the sections they have been more or less formally summarized. It remains to call attention here to the most prominent results of the inquiry as a whole, with as little reference to detail as may be consistent with clearness, referring the reader to the detailed discussion of individual points, and to the summaries, given at the conclusion of preceding sections, for any further illustration or confirmation that may be needed.

The twenty-second crop of barley in succession is now growing, in a field immediately adjoining that devoted to the experiments on wheat, and having a soil and subsoil of similar general characters, namely, "a somewhat heavy loam, with a subsoil of raw yellowish red clay, but resting in its turn upon chalk, which provides good natural drainage." It is obvious that, in wet seasons, such a soil is not well suited for the growth of the crop after roots fed on the land by sheep, as is the custom of the locality; but the results which have been recorded abundantly prove that, when grown under favourable conditions, large crops of barley, of good quality, may be obtained from such land.

Without manure, the average produce of barley, over twenty years, was 21 bushels of dressed corn, of 52¼ lbs. per bushel, and 12 cwts. of straw. The quantity fell off considerably, but the quality was considerably higher over the second than over the first ten years. Compared with wheat without manure, barley gave more corn, less straw, but nearly the same quantity of total produce; it, however, fell off more in produce of grain, and about equally in straw, over the later years.

By farmyard manure, the average annual produce was more than 48 bushels of dressed corn, of 54¼ lbs. per bushel, and 28 cwts. of straw. The quantity of both grain and straw, and the quality of the grain, were considerably higher over the second than over the first ten years. As without manure, so with farmyard manure, barley, compared with wheat, yielded more corn, less straw, but much about the same quantity of total produce.

Mineral manures alone gave very poor crops; and the quantity of both corn and straw fell off considerably during the later years. With barley there was much more grain, rather less straw, but considerably more total produce than with wheat.

Nitrogenous manures alone gave much more barley than mineral manures alone; the produce declined much less in the later years; and for twenty years in succession, fair, though not full, crops were obtained.

Nitrogenous and mineral manures together gave, for twenty years in succession on the same land, rather more of both corn and straw than farmyard manure, considerably more than the average barley crop of the country under rotation, and an average weight per bushel of between 53 and 54 lbs. With the same amount of nitrogen, and the same mineral manure, applied for twenty years, in the autumn for wheat,

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1 A. 200 lbs. Ammonia-Salts (4).
2 A. 200 lbs. Ammonia-Salts, 3¼ cwts. Superphosphate.
3 A. 200 lbs. Ammonia-Salts, 200 lbs. Sulphate Potass (2). 100 lbs. Sulphate Soda (3), 100 lbs. Sulphate Magnesia.
4 A. 200 lbs. Ammonia-Salts, 200 lbs. Sulphate Potass (2), 100 lbs. Sulphate Soda (3), 100 lbs. Sulphate Magnesia, 3¼ cwts. Superphosphate.

(5)
1 AA. 275 lbs. Nitrate Soda.
2 AA. 275 lbs. Nitrate Soda, 3¼ cwts. Superphosphate.
3 AA. 275 lbs. Nitrate Soda, 200 lbs. Sulphate Potass (2), 100 lbs. Sulphate Soda (3), 100 lbs. Sulphate Magnesia.
4 AA. 275 lbs. Nitrate Soda, 200 lbs. Sulphate Potass (2), 100 lbs. Sulphate Soda (3), 100 lbs. Sulphate Magnesia, 3¼ cwts. Superphosphate.

(5)
1 AAS. 275 lbs. Nitrate Soda, 400 lbs. Silicate Soda (6).
2 AAS. 275 lbs. Nitrate Soda, 400 lbs. Silicate Soda (6), 3¼ cwts. Superphosphate.
3 AAS. 275 lbs. Nitrate Soda, 400 lbs. Silicate Soda (6), 200 lbs. Sulphate Potass (2), 100 lbs. Sulphate Soda (3), 100 lbs. Sulphate Magnesia.
4 AAS. 275 lbs. Nitrate Soda, 400 lbs. Silicate Soda (6), 200 lbs. Sulphate Potass (2), 100 lbs. Sulphate Soda (3), 100 lbs. Sulphate Magnesia, 3¼ cwts. Superphosphate.

(7)
1 C. 1000 lbs. Rape-cake.
2 C. 1000 lbs. Rape cake, 3¼ cwts. Superphosphate.
3 C. 1000 lbs. Rape-cake, 200 lbs. Sulphate Potass (2), 100 lbs. Sulphate Soda (3), 100 lbs. Sulphate Magnesia.
4 C. 1000 lbs. Rape-cake, 200 lbs. Sulphate Potass(2), 100 lbs. Sulphate Soda (3), 100 lbs. Sulphate Magnesia, 3¼ cwts. Superphosphate.

(8)
1 N. 275 lbs. Nitrate Soda.
2 N. 275 lbs. Nitrate Soda (550 lbs. Nitrate for 5 years, 1853, 4, 5, 6 and 7.)

M. 100 lbs. Sulphate Soda (9), 100 lbs. Sulphate Magnesia, 3¼ cwts. Superphosphate (commencing 1855; 1852, 3 and 4, unmanured.)

5 O. 200 lbs. Sulphate Potass (2), 3¼ cwts. Superphosphate, (200 lbs. Ammonia-Salts, also, for the first year, 1852, only.)

5 A. 200 lbs. Sulphate Potass (2), 3¼ cwts. Superphosphate, 200 lbs. Ammonia-Salts.

6 { 1. Unmanured continuously.
2. Ashes (burnt soil and turf).

7. 14 tons farmyard manure.

REFERENCES.

(1.) "3¼ cwts. Superphosphate of Lime"—in all cases made from 200 lbs. bone-ash, 150 lbs. Sulphuric acid, sp. gr. 1.7 (and water).

(2.) Sulphate Potass, 300 lbs. per annum for the first six years, 1852–7.

(3.) Sulphate Soda, 200 lbs. per annum for the first six years, 1852–7.

(4.) The "Ammonia-Salts," in all cases equal parts of Sulphate and Muriate of Ammonia of Commerce.

(5.) Plots "AA" and "AAS," first six years, 1852–7, instead of Nitrate of Soda, 400 lbs. Ammonia-Salts per annum; next ten years, 1858–1867, 200 lbs. Ammonia-Salts per annum; 1868, and since, 275 lbs. Nitrate of Soda per annum. 275 lbs. Nitrate of Soda is reckoned to contain the same amount of nitrogen as 200 lbs. "Ammonia-Salts."

(6.) Plots "AAS," the application of Silicates did not commence until 1864; in 1864, 5, 6 and 7, 200 lbs. Silicate of Soda and 200 lbs. Silicate of Lime were applied per acre, but in 1868, and since, 400 lbs. Silicate Soda, and no Silicate Lime. These plots comprise respectively, one-half of the original "AA" plots, and excepting the addition of the Silicates, have been, and are, in other respects, manured in the same way as the "AA" plots.

(7.) 2000 lbs. Rape-cake per annum for the first six years, and 1000 lbs. only, each year since.

(8.) 300 lbs. Sulphate Potass and 3¼ cwts. Superphosphate of Lime, without Nitrate of Soda, the first year (1852); Nitrate alone each year since.

(9.) Sulphate Soda, 200 lbs. per annum, 1855, 6 and 7.

and in the spring for barley, the barley gave much more corn, more straw, and nearly one-third more total produce than the wheat.

Thus, then, with barley as with wheat, mineral manures alone failed to enable the plant to obtain sufficient nitrogen and carbon to yield even a fair crop. The greater effect of nitrogenous manures alone showed that the soil, in its practically corn-exhausted condition, was relatively richer in available mineral constituents than in available nitrogen. And the generally greater effect by nitrogenous and mineral manures together, than by farmyard manure—which contained not only very much more nitrogen, but a large amount of decomposing carbonaceous organic matter, and probably more of every mineral constituent than the crop—showed that the nitrogen of the farmyard manure was in a far less rapidly available condition, and that its supply of carbon was at any rate unessential.

It is hardly necessary to add, that the field results with barley, equally with those with wheat, are entirely inconsistent with the mineral theory so long in controversy, according to which, fertility was quite independent of the ammonia conveyed to the soil; if only the necessary mineral constituents were supplied in sufficient quantity and in available form, our cultivated plants, graminaceous as well as leguminous, would derive sufficient ammonia from the atmosphere; the presence of ammonia in our manures was immaterial; and the entire future prospects of agriculture depended upon our being able to dispense with ammonia in our manures, therefore with animal manures.

It is a very remarkable and very significant fact, that not only by farmyard manure, but also by artificial manures containing no carbon, an average of not far short of 50 bushels of barley grain (or more if reckoned at only 52 lbs. per bushel), and nearly 30 cwt. of straw, or much more than the average crop of the country under rotation, should have been obtained by the growth of the crop year after year on the same land for twenty years in succession. Not only was such an average obtained over the twenty years, but there was even rather more corn, higher quality, only little less straw, and nearly identical total produce (corn and straw together), over the second compared with the first ten years, showing that, hitherto at least, there is practically no exhaustion by the continuous growth of such large crops under such conditions of soil and manuring.

It was with farmyard manure, however, the annual use of which has resulted in a very great accumulation within the soil, of nitrogen, of carbon, and probably of every mineral constituent also, that there has been the greatest increase of produce, and especially of corn, over the second as compared with the first ten years. On the other hand, without manure, with mineral manure alone, and with ammonia-salts alone—that is, with defective soil conditions—there was a considerable deficiency of both corn and straw over the second half of the period; the greater deficiency the more defective the manuring, and the greater the relative deficiency of nitrogen in the soil; for the falling off was considerably more marked with mineral manure alone, than with ammonia-salts alone.

It will be obvious that an average of 50 bushels of barley grain, and 30 cwts. of straw, would not be maintained without great fluctuations from year to year, according to season. Indeed in no two years of the twenty did one and the same manure yield precisely the same result both as to the quantity and the quality of its produce; nor were the seasons which were more or less favourable than the average for one description of manure equally favourable for other descriptions. Thus, comparing the least and most productive seasons of the twenty, there were obtained (reckoning the total corn at 52 lbs. per bushel), without manure 15¼ and 37¾ bushels, or a difference of 22 bushels; with farmyard manure, 32 bushels and 60 bushels, or a difference of 28 bushels: lastly, with the two most productive artificial manures, there were obtained 30¾ and 36¼ bushels in the worst season, and 66 and 68 bushels in the best season, or a difference in favour of the good season of 35¼ and 31¾ bushels of grain. That is to say, with one and the same expenditure for manure, there was a difference in the quantity of the produce obtained in the two seasons, of from nearly 32 to over 35 bushels of corn, besides, in one case, nearly a ton of straw.

Not only, then, has the average produce over twenty years, by artificial, nitrogenous and mineral manures, considerably exceeded the average barley crop of the country with rotation, but the difference between the produce by one and the same manure in the least and most favourable seasons of the twenty was, itself, not much less than would represent the average barley crop of many localities.

As we have in substance frequently said, it is but a truism to assert that the growing plant must have within its reach a sufficiency of the mineral constituents of which it is to be built up. But the results obtained with barley, as well as those with wheat, have shown that whilst it is essential that there be a liberal provision of mineral constituents within the soil, the amount of produce is more dependent on the supply by manure of available nitrogen than of any other constituent.

The practical question obviously arises: How much ammonia or its equivalent of nitrogen in some other form, will, on the average, be required to yield a given amount of increase of wheat or barley grain, and its proportion of straw?

In our report on the growth of wheat for twenty years in succession on the the same land, it was shown that the quantity of increase obtained from a given amount of ammonia, or its equivalent of nitrogen, in manure, varied exceedingly according to the amount applied, to the provision of mineral constituents within the soil, and to the seasons. It was, however, stated, as a general practical conclusion, that, under the conditions the most comparable with those of ordinary practice, approximately 5 lbs. of ammonia, or its equivalent of nitrogen, were, on the average, required to yield 1 bushel increase of wheat, and its proportion of straw.

In like manner the experiments with barley have shown a very wide variation in the amount of ammonia required to yield a given quantity of increase, according to the amount applied, to the provision of mineral constituents within the soil, and to the seasons. Thus, with superphosphate and 200 lbs. of ammonia-salts per acre per annum, for six years, 3.26 lbs., but with 400 lbs., 5.06 lbs. of ammonia were required to produce 1 bushel increase of barley grain and its straw.

Again, with 200 lbs. of ammonia-salts for twenty years, there were required, on three plots where it was used with superphosphate, 2.13, 2.41 and 2.10 lbs.; on one plot where it was used with salts of potash, soda, and magnesia, without superphosphate, 3.59 lbs.; and on one without any mineral manure at all, 3.68 lbs., of ammonia to yield one bushel of barley and its straw.

Lastly, with only 200 lbs. of ammonia-salts per acre per annum, and with superphosphate also applied, the difference in the amount of ammonia required to yield 1 bushel of increase was, according to season, from about 1¼ lbs. in the two most favourable, to 5.36 and 4.48 lbs. in the two least favourable seasons; whilst, with only the same moderate amount of ammonia-salts, but used without superphosphate, or without any mineral manure at all, the difference in result according to season was very much greater still.

Notwithstanding these very considerable and very significant variations, it may be concluded, from a review of the whole of the data bearing on the point, that when an increase of barley is obtained by means of artificial manures, such as salts of ammonia, nitrate of soda or Peruvian guano, an increase of 1 bushel of grain, and its straw, may, taking the average of seasons, be calculated upon for every 2 to 2¼ lbs. of ammonia (or its equivalent of nitrogen, 1.65 to 1.86 lbs.) supplied in the manure—provided the quantity applied be not excessive, and there be no deficiency of mineral constituents within the soil. When, however, rape-cake is used, rather more nitrogen in that form will be required to yield a given increase; but when the increase is obtained by sheep-folding, or by farmyard manure, very much less increase will be yielded in the year of the application, in proportion to the nitrogen contained in the manure.

Thus, whilst it was concluded that, on the average, about 5 lbs. of ammonia (or its equivalent of nitrogen) were required to yield 1 bushel of increase of wheat, and its proportion of straw, it is now assumed that only 2 to 2¼ lbs. of ammonia are required to produce 1 bushel increase of barley, and its straw. But whilst an average bushel of wheat may be reckoned to weigh 61 lbs., and its average proportion of straw 105 lbs., an average bushel of barley will weigh only 52 lbs., and its straw only 63 lbs. Hence, whilst it required 5 lbs. of ammonia in manure to yield 61 lbs. of wheat grain, and 105 lbs. of straw=166 lbs. of total produce, it only requires from 2 to 2¼ lbs. to yield 52 lbs. of barley grain and 63 lbs. of straw=115 lbs. of total produce. In other words, for the production of 100 lbs. increase of total produce of wheat, it required 3 lbs., and for the production of 100 lbs. increase of barley (containing a larger proportion of grain, but about the same amount of nitrogen) it required only from about 1¾ to 2 lbs. of ammonia in manure. That is to say, it required much more ammonia to yield a given amount of increase when applied in the autumn for wheat, than when in the spring for barley.

The following questions obviously suggest themselves:

What proportion of the nitrogen supplied in manure will probably on the average be recovered in the increase of the crop for which it is applied?

Will the at first unrecovered amount have any marked effect on the immediately or early succeeding crops?

Will there be any residue retained by the soil and the subsoil, in such a state of combination and distribution, as only to be yielded up, if ever, in the course of a long series of years?

Will there be any drained away and lost?

Lastly, will the answers arrived at on these points, in regard to wheat or to barley, be equally applicable to both crops?

With regard to the proportion of the nitrogen of artificial manures recovered in the increase of crop obtained by their use, in former papers it has been estimated, taking the average over a comparatively limited number of years, that about 40 per cent. was recovered in the increase of wheat, of barley, and of meadow hay indifferently. But, by the aid of numerous new determinations of nitrogen in the produce of wheat for twenty years, of barley for twenty years, and of oats for three years, it now appears that, with the same mixed mineral manure in each case, and the same amount of ammonia-salts applied in the autumn for wheat, and in the spring for barley and for oats, rather less than one-third of the supplied nitrogen has been recovered in the increase of the wheat, but nearly one-half in that of the barley and the oats. When, however, there were applied, even for wheat, the same mineral manure and nitrate of soda, the latter sown in the spring, a not much less proportion of its nitrogen was recovered in the increase of the crop, than in the case of the ammonia-salts applied for barley in the spring, or of the ammonia-salts or nitrate of soda applied for oats in the spring.

Not only, then, did a given amount of nitrogen, supplied as ammonia-salts, yield much more increase of produce in the years of its application, when applied in the spring for barley than when in the autumn for wheat, but a larger proportion of it was recovered in the increase of the spring-sown crop.

The field experiments have further shown, that the at first unrecovered amount yielded scarcely any increase at all in succeeding years in the case of the wheat, but a considerable increase in that of the barley.

With both crops, however, there remained a considerable amount of the supplied nitrogen not recovered in either at the first or the early succeeding increase of produce; but there is obviously very much more to be otherwise accounted for in the case of the autumn-sown wheat than of the spring-sown barley.

With regard to retention by the soil, the results of the analysis of samples of the soils of many of the differently manured plots in the experimental wheat-field, taken in all down to a depth of 27 inches, showed that a considerable amount of the nitrogen which had been supplied in the manure, and not recovered in the increase of crop, was accumulated within the soil; but it was concluded that a larger proportion remained unaccounted for to the depth examined, than was there traceable, and that some of this had passed off by the drains, and some into the lower strata of the subsoil.

With regard to loss by drainage, numerous analyses, by Dr. Voelcker and Dr. Frankland, of the drainage-waters from the Rothamsted experimental wheat-plots, confirmed the supposition that there had been a considerable loss of the nitrogen of the manures in that way. They showed that the quantity of nitrates in the drainage-water was the greater the greater the amount of ammonia-salts applied; and that, after autumn sowing, the quantity was very much greater in the winter than subsequently in the spring and summer.

Calculation showed that, for every 1 part of combined nitrogen per 100.000 parts of drainage-water, there will be a loss of 2¼ lbs. of nitrogen per acre for every inch of rain passing beyond the reach of the roots as drainage of that strength. In one case of winter drainage, after an application of 600 lbs. of ammonia-salts per acre in the autumn, Dr. Frankland's analysis showed 7.841 parts of nitrogen per 100.000 parts of water, corresponding to a loss of nearly 18 lbs. of nitrogen per acre, provided (which, however, is not probable) that an inch of rain had passed as drainage of that strength.

As would be expected, as the nitrate of soda was, even for wheat, always sown in the spring, the autumn and winter drainage from the nitrated plot always contained much less nitrogen than that collected at the same date from the plots manured with ammonia-salts in the autumn. Owing, however, to the much less capacity of a given surface of soil for the absorption of nitrate of soda, or other nitrates arising from its decomposition, than of the ammonia of ammonia-salts, heavy rains, soon after sowing, would carry off more of the nitrogen from nitrate of soda than from a corresponding dressing of ammonia-salts. In one case Dr. Voelcker found, in the drainage collected from the nitrated plot soon after a dressing of 550 lbs. of nitrate per acre (= 400 lbs. ammonia-salts), applied in the spring, 5.83 parts of nitrogen per 100.000 parts of water, corresponding to a loss of about 13 lbs. of nitrogen per acre per inch of rain passing.

These facts, showing how great may be the loss of the nitrogen of manure by drainage, are obviously of the greatest practical importance, and demand very serious consideration.

Owing to the difficulty of determining with

certainty, either the total amount of nitrogen retained by the soil within the reach of the roots, the proportion of the total rain which would pass beyond the reach of the roots, or the average composition of the drainage-water, absolute proof whether the whole of the supplied nitrogen which is not recovered in the crop is either retained by the soil, or lost by drainage, is not at command. Still, a consideration of such data as are available in reference to the points here indicated, points to the conclusion that the whole of the nitrogen which was applied as ammonia-salts or nitrate of soda to the wheat, was either recovered in the increase of crop, accumulated within the soil, or lost by drainage.

As already said, as the proportion of the nitrogen of ammonia-salts which was recovered in the increase of produce was much greater in the experiments with barley than in those with wheat, there remained of course much less, in its case, to be accounted for by accumulation in the soil, and by drainage.

Only few determinations of nitrogen have as yet been made in the soils of the barley plots; but, so far as can be judged from the results obtained hitherto, it seems probable that there is less accumulation than in the case of the wheat, especially in the lower layers. It seems pretty certain, too, that there must be much less loss by drainage; but, as the experimental barley-field is not artificially drained, no direct evidence can be adduced on the point. It may be observed, however, that as the ammonia-salts are sown for the barley in the spring, when the soil is in a porous condition, when there is comparatively little risk of washing out, and when growth almost immediately succeeds, there will be a less immediate and wide distribution of the ammonia, or of the nitrate resulting from its oxidation, a larger proportion at once taken up by the growing crop, and, probably, a larger proportion fixed near the surface before the winter rains, and remaining available there for succeeding crops.

Not only, then, do the results point to a satisfactory explanation of the loss of nitrogen which has been observed in the use of artificial nitrogenous manures, but also of the much greater loss when they are applied in the autumn for wheat, than when in the spring for barley or for oats. In confirmation of the explanation on the latter point, may be cited the facts that, not only was there on the average much more increase even of wheat, and much more nitrogen recovered in the increase, when a given amount of it was applied as nitrate of soda in the spring than when as ammonia-salts in the autumn, but the difference in favour of the spring-sown manure was especially marked after unusually wet autumns and winters.

There is another point to notice in connection with the action of nitrate of soda. A given surface of soil has much less power to retain either nitrate of soda, or other nitrates, than ammonia, and so far their nitrogen is, *cæteris paribus*, more liable to loss by drainage. Yet, when frequently used on the same land, such was the effect of the nitrate, or its products of decomposition, aided by increased development of root, in causing the disintegration, and so increasing the porosity and surface of the clay subsoil, that there would appear to have been not only a greater retention of moisture in an available form by the subsoil, rendering the growing crop more independent of drought, but also a greater retention of nitrates than would be anticipated considering their solubility, and, hence, a more lasting effect from previous applications than would otherwise be expected. On the other hand, where, as in the case of the experiments at Rothamsted, nitrate of soda has been used in large quantities so many years in succession, the surface soil has retained so much moisture as to be difficult to work after wet weather.

The results have shown that a considerably less proportion of the nitrogen applied as rape-cake, than as either ammonia-salts or nitrate of soda, was recovered in the increase of crop within a given period of time, and again considerably less of that applied in farmyard manure than in rape-cake. Owing to the slow decomposition of the nitrogenous organic matter of these manures, their nitrogen is necessarily but slowly available. It would appear, however, to be at the same time less subject to loss by drainage; and analysis has shown that a large proportion of their nitrogen is retained by the soil, becoming but very gradually available for a considerable length of time. Indeed, analysis showed that where farmyard manure had been applied for wheat every year for twenty-five years in succession, the top 9 inches of soil contained nearly twice as high a percentage of nitrogen as the corresponding layers of any of the artificially manured plots, which, though they received much less nitrogen annually, as ammonia-salts or nitrate of soda, nevertheless yielded larger crops. Still, there is a large amount of the nitrogen of the dung not yet satisfactorily accounted for; but, whether there will be an ultimate loss of a greater or less proportion of that supplied, than when ammonia-salts or nitrate of soda is used, the data at present at command do not enable us to determine with certainty.

It is, then, established, that there is a great liability to loss by drainage of the nitrogen of manures, the available amount of which, more than of any other constituent, rules the amount of produce, under the existing conditions of British agriculture. The mineral constituents being, however, equally essential for growth, it is obviously important to have some direct experimental evidence showing whether or not they are also liable to such loss.

The field experiments with wheat have afforded conclusive evidence of the marked effect of potass and phosphoric acid supplied more than twenty years previously, when nitrogenous manures were afterwards applied to render them available; and, not only are the results of the analysis of the produce consistent with this, but the analysis of the soils has shown their accumulation, and that of the drainage-waters their comparatively little liability to loss in that way. Indeed, it may be concluded that, at any rate in the case of the heavier soils, these constituents, which, by the sale of corn and meat, would otherwise be the most likely to become relatively deficient, and which in that point of view are the most important to consider, are almost wholly retained within the reach of the roots.

Let it be granted, that, in one field at Rothamsted, wheat, and in another, barley, have been grown for many years in succession, the same manure being applied to the same plot year after year; that, under these circumstances, it has been found that mineral manures alone have little or no effect, that nitrogenous manures alone have very much more, and that nitrogenous and mineral manures together will continue to yield as large crops as farmyard manure annually applied, and much larger than the average produce of the country under rotation. It may still be asked, whether conclusions drawn from results obtained under such unusual conditions may be trusted as any guide to the requirements of the crops when grown on any other land, or in the ordinary course of farming?

In our paper on the growth of wheat for twenty years in succession on the same land, we adduced the results of direct experiments, made not only in another field at Rothamsted, but also in other localities, on soils of very different description and in very different condition. The result in each case was, as in the experimental field, that there was but little increase by mineral

manures alone, much more by ammonia-salts alone, and more still by ammonia-salts and mineral manure together. We further stated our conviction, founded on a very extensive acquaintance with the practical experience of farmers in the use of artificial manures in every district of Great Britain for many years, that, in 99 cases out of 100 in which wheat is grown in the ordinary course of agriculture with rotation, the supply of immediately available mineral constituents is in excess relatively to the immediately available supply of nitrogen.

In our former paper on the growth of barley, and again in section V of the present paper, evidence of a similar kind is adduced in regard to that crop. Two sets of experiments are quoted. In one, barley was grown for three years in succession on a series of plots which had previously been differently manured, and grown ten crops of turnips in succession. In the other, it was grown in four-course rotation, without manure, and with different descriptions of manure. The evidence of these other experiments is entirely confirmatory of the conclusion, that mineral manures alone will not yield fair crops of barley, and that an essential condition for the growth of full crops, whether in rotation or under less usual conditions, is a liberal supply of *available nitrogen within the soil.*

Further, as in the case of wheat, so also in that of barley, the common experience of the country at large, in the use of artificial manures to that crop, is entirely confirmatory of the conclusions to which the results of the experiments on its growth year after year on the same land would lead.

It may here be remarked, that the greater liability to loss by drainage of the nitrogen, than of the more important mineral constituents of manure, is doubtless one element in the explanation of the fact of the prevailing excess of available mineral constituents, relatively to available nitrogen, in soils generally, under the ordinary course of agriculture in this country.

Those who have examined for themselves the evidence that has been adduced, and carefully considered the conclusions that have been drawn in reference to the great number of points which the enquiry has opened up, will probably feel that they do not require any specific receipts to be laid down for their guidance, and that they will profit more by the direction which the study of the facts must give, to their own observation and reflections on what comes before them in the course of their daily experience. Indeed, under any circumstances, it must be left to the intelligence and the judgment of the individual farmer to decide upon the degree in which any special recommendations will be applicable to his own particular soil, and other circumstances.

Still, in bringing this long report to a conclusion, a few words should be offered by way of pointing out the more directly practical application of the results

For twenty years in succession on the same land, an annual expenditure of less than £3 per acre in artificial manures has yielded an average produce of 6 quarters of dressed barley, of good quality, and nearly 1¼ ton of straw. Any practical farmer can estimate what would be the additional expense upon the crop, in the way of rent, cultivation, harvesting, bringing to market, etc ; and, having done so, the result will doubtless show a considerable profit.

The soil at Rothamsted is more suitable for wheat than it is for the growth of barley after roots, as is the common practice of the locality ; but the facts show that it will nevertheless grow large crops, of good quality, under favourable circumstances. Indeed, it may be laid down as a general rule, applicable to the country at large, that, on the heavier soils, full crops of barley of good quality may be grown with great certainty after a preceding corn-crop, under the following conditions:

First of all, it is essential that the land be got into good tilth. It should be ploughed up when dry, as soon as practicable after the removal of the preceding crop. In the spring it should be prepared for sowing by ploughing or scuffling as early in March as possible, if sufficiently dry.

The artificial manure employed should contain nitrogen, as ammonia or nitrate (or organic matter), and phosphates.

From 40 to 50 lbs. of ammonia (or its equivalent of of nitrogen as nitrate) should be applied per acre. These quantities would be supplied in:

1¼ to 2 cwts. of sulphate ammonia, or

1¾ to 2¼ cwts. of nitrate of soda.

With either of these there should be employed 2 to 3 cwts. mineral superphosphate of lime.

Of late years the composition of Peruvian guano has been so variable and uncertain, that it is quite impossible to estimate how much of it would be required to supply nitrogen equal to from 40 to 50 lbs. of ammonia. It is impossible, therefore, under such circumstances, to recommend it. If, however, the agents of the Peruvian Government were to manufacture their guano into a substance of uniform quality, and to guarantee to deliver it of a stated composition, it would be quite otherwise; and, as the guano itself contains phosphates, if the ammonia required were purchased in that form, superphosphate need not be also employed.

Rape-cake is also a good manure for barley. From 6 to 8 cwts. would supply about as much nitrogen as would be equal to from 40 to 50 lbs. of ammonia. But, a smaller proportion of the nitrogen of rape-cake, than of sulphate of ammonia, nitrate of soda, or Peruvian guano, will be effective within a given time. In the experiments at Rothamsted about 9 cwts. of rape-cake per acre per annum, gave an average annual produce, over 14 years in succession, of 44 bushels of dressed corn, of nearly 55 lbs. per bushel. With rape-cake, as with guano, the addition of superphosphate is unnecessary.

Whatever manure be used, it should be broken up, finely sifted, sown broadcast, and harrowed in with seed.

Economy in the cost of the nitrogen is the essential point to be considered in the selection of the manure to be used. To enable the farmer to mke an advantageous choice, according to the market price of the different manures at the time, it may be useful to state, as a basis of the calculation, that 1 cwt. of nitrate of soda, of the quality usually imported, contains nitrogen equal to 21 lbs. of ammonia; and if the nitrate cost 15s. 9d. per cwt, that will be equivalent to 9d. per lb. for ammonia, or 15s. per ton for every 1 per cent. of ammonia (or nitrogen equal ammonia) which the manure contains. According to the experiments at Rothamsted, it would appear that, at equivalent prices, a given amount of nitrogen as nitrate of soda may, in the long run, be more effective than an equal amount as ammonia; for, contrary to the current opinion, the full effect of the nitrate was not obtained until it had been used for some years on the same plot.

The liability to loss of the nitrogen of manure by drainage has been shown to be very great. It will, of course, vary very much, according to the characters of the soil and subsoil, and of the seasons. But as it is much greater during the late autumn and winter months, than in the spring and summer, nitrate of soda, sulphate of ammonia, or Peruvian guano, should always be sown in the spring; for wheat as a top dressing in March, and for barley or oats as described above.

By a more liberal application of manure per acre for the root crop, the area devoted to it may be considerably

reduced with comparatively little reduction in the amount of the crop on the farm as a whole. Barley might then be grown more frequently with an increase of profit to the cultivator, and without lessening the renting value of the land.

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